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Improved Boiler Feeder.

This feeder presents some new features which seem to commend it to the attention of engineers. It is claimed to effectually prevent the collection and deposition of sediment in the boiler from impure water. The California Steam Navigation Company has run boats three thousand miles with tubular boilers, using this heater, without cleaning boilers, although the water contained as much mud as that of the Missouri river.

Fig. 1

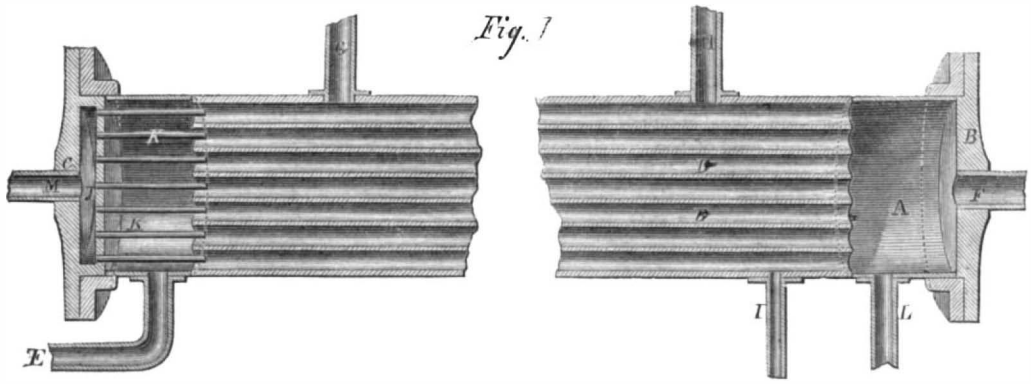


Fig. 2

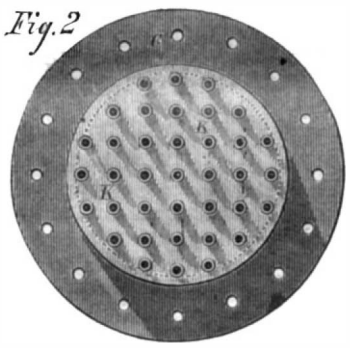
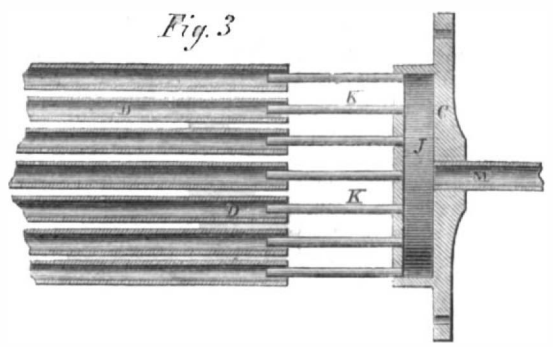


Fig. 3



CROSS'S BOILER FEEDER.

The case, A, Fig. 1, is of sheet iron or other suitable material, cylindrical, or in any other convenient form, closed at the ends by the heads, B and C, and having, at a short distance from the ends, transverse partitions, which support the ends of the tubes, D. The water to be heated enters the shell by the pipe, E, and passes through the tubes, entering the boiler by the pipe, F. The exhaust steam enters at G and leaves at H. The pipe, I, discharges the condensed steam in the form of water. The head, C, is provided with a chamber, J, from the inner plate of which small tubes, or nozzles, K, project into the water tubes D. The sediment which may gather in the water tubes is blown out and through the pipe, L, by steam admitted at will through the pipe, M, from the boiler. The steam and water from the boiler being discharged through the nozzles, K, into the tubes, D, effectually washes them, thus preventing the collection of sediment in the boiler.

It will be seen that the exhaust steam traverses the length of the heater surrounding the water tubes, and thoroughly heats the water before its admission to the boiler. The gradual circulation of the water through the cluster of pipes favors the deposition of the sediment mechanically suspended in it, which can be readily removed by injecting the steam from the boiler through the pipe, M, and the nozzles, K.

This improvement was patented through the Scientific American Patent Agency Oct. 17, 1865, by William B. Cross, of Sacramento, Cal., who will furnish all necessary information.

An Iron Mountain in Sweden.

From the London *Mining Journal* we learn that a company, formed in England for the development of Swedish iron mines, from failure to pay their men, have stopped their works. A meeting of the stockholders has been held in London and it is hoped something will be done to start the undertaking on a firm basis. It was reported at that meeting that the company own a "mountain of iron," containing, by assay, seventy-two per cent of pure metallic iron. The principal drawback to the realization of the wealth of the region is its locality and the climate; a long road over a vast plain being necessary, and the long winters disheartening the laborers. The construction of an easily-traveled road, it was thought, would, by frequent communication, be an inducement to the employés to make permanent engagements.

The Palliser Gun.

Last August four Palliser guns were tested with perfect success at the proof butt in the Royal Arsenal at Woolwich, under the superintendence of Lieutenant Colonel Freeth, Assistant Superintendent of the Royal Gun Factories. These guns were formerly cast-iron 32-pounders and 24-pounders, and have been converted into 64-pounders and 56-pounders, at Elswick. Twenty more of these guns arrived the same day at Woolwich, and will at once be sent to proof. A 64-pounder Palliser gun has also undergone a most severe test of endurance. This was a 32 pounder, weighing only 58 cwt. According to the *Times*, the test was as follows:—Two rounds, with charges of 16 lbs. of powder and 150-lb. cylinders; 10 rounds, with charges of 20 lbs. of powder and 100-lb. cylinders; and, finally, 10 rounds, with 16 lbs. of powder and 64 lbs. shells. The shells were loaded with their fuse holes toward the powder, and, as the fuses had been taken out, the flash of the discharge set fire to the powder in the shells and burst them in the gun. It was generally expected that this test would have burst the gun, or, at all events, that it would have blown off the muzzle or otherwise have rendered it unserviceable; but beyond the one fact of the bore being scratched by the splinter of the shells no injury was perceptible, and the gun was loaded with the same facility and fired as before. It appeared from a subsequent examination that some of the shells had burst before they had moved, and that others had burst close to the muzzle of the gun. A number of 64-lb. shot were then fired with 16-lb. charges, but, instead of the shot being rammed home, they were only pushed down to certain positions in the gun, so as to leave vacant spaces of 5 inches, 10 inches, 15 inches, 20 inches, and 25 inches between the powder and the shot. To the astonishment of every one present the gun had not sustained the slightest injury. It was therefore decided by the Ordnance Select Committee to put the gun through a supplementary trial to ascertain its maximum or highest power of endurance, when it will have to fire 20-lb. to 25-lb. and 30-lb. charges, with cylinders of 150 lbs. weight. Major Palliser has expressed great confidence in the strength of the gun, and states that he has no fear of the result of any reasonable amount of proof, even beyond what is absolutely necessary. The trial, it is admitted, has already borne out the anticipations of the inventor and manufacturers, and has fully justified the recommendation of the Ordnance Select Committee and their introduction of these guns for the consideration of the War Department to use up the heavy stock of guns on hand. On account of their weight, their service charges will be only 6 lbs. or 8 lbs. of powder. Sufficient evidence, it is stated, has already been obtained to prove that we have thus a most efficient and reliable addition to our stock of rifled ordnance—a fact which, in the present difficulties with which the Government is embarrassed for want of serviceable guns, will be hailed with much satisfaction, more especially as the two new guns now pronounced successful—those of Major Palliser and Mr. Frazer—will be produced at a cost far below that of the present guns, in which the country have long since ceased to have any confidence.—*Mechanics' Magazine.*

Manufactures as a Means of Wealth.

The manufactures and commerce of England have made her the richest country on the globe. Her commerce is a consequence of her manufactures, which have also swollen the value of farming lands to a proportion unsurpassed by those of any other nation. New England, with a sterile soil and unfavorable climate, although boasting some of the finest farms in the country, owes her remarkable prosperity to her manufactures and the trade and commerce which they foster and sustain. The Middle States also sustain their importance by this source of wealth, rather than by their agricultural productions. But this interest is vastly improved in value by the establishment of manufactories. It is estimated that when the agricultural capital of England was £3,311,000,000 and the investment in manufactures £218,000,000, the profits on the former were only 13 per cent while the latter produced 120 per cent. In her manufactures, therefore, must we look for the main source of England's wealth.

THE total value of prizes to be given at the Paris Exhibition is $190,000 in gold. In the department of arts there are seventeen grand prizes valued at $400 each; thirty-two first prizes valued at $160 each; forty-four second prizes, $100 each; and forty six third prizes, $80 each.

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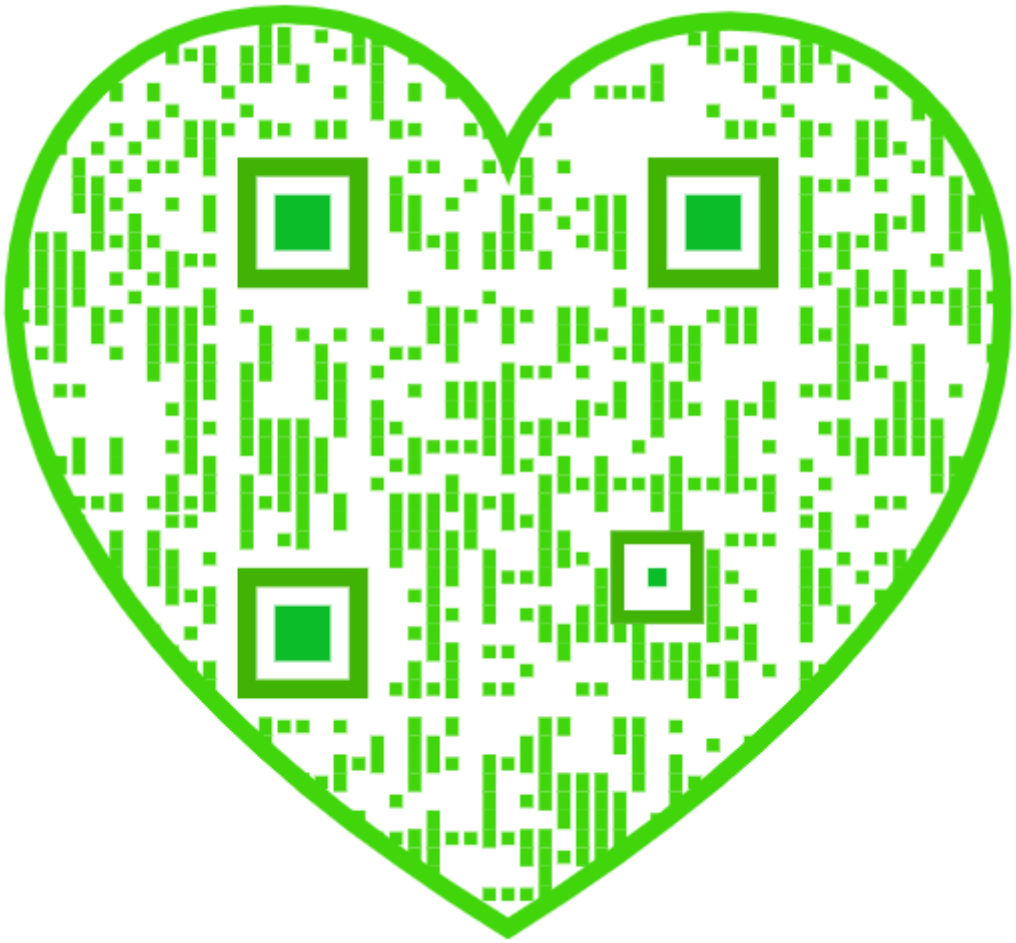

CULTIVATION AND MANUFACTURE OF OSIERS.

A writer in the Boston *Advertiser* says that the osier, or basket willow, is a very profitable crop, and can be grown upon lands too wet and cold for ordinary crops. He says it will yield from two to four tuns, green, per acre—worth $40 per tun—and, peeled, it has been sold as high as $200 per tun within two years.

Without indorsing entirely his statements, it is an indisputable fact that the osier can be made a very profitable product of the farm, even when the manufactory is distant from the place of production. After being once fairly started it will almost take care of itself, requiring only the attention necessary to its cutting and preparation for the manufacturer. It is tenacious of life, is not frost killed, and, after the second year, continues indefinitely to yield an ever-increasing amount. It is easily cultivated from cuttings, and, keeping the soil mellow and free from weeds and grasses the first two or at most three years, it asserts its supremacy and adheres as tenaciously to the soil as the Canada thistle.

The principal obstacle to its general cultivation is the labor of peeling it, a work that must be performed at or near the locality of its growth. The shoots are cut after the ground is frozen, to prevent the roots from being pulled from the soil in the act of cutting. They are bound in large bundles and placed in a tank, or on a level piece of ground, supported in an upright position, and water to the depth of two or three inches is allowed to flow over the buts. After standing until spring, the stem has absorbed water enough, by capillary attraction, to render the removal of the bark easy. This is done by drawing the shoots through a split sapling or between two upright pieces of iron. This is a labor of patience and cannot be slovenly performed. Although machines have been devised for the work, they have not, we believe, proved entirely satisfactory. The attention of our mechanics and inventors is directed to this fact.

The osier is largely used in the manufacture of chairs, settees, baskets, sleigh and wagon bodies, and even tables, and is capable of being applied to a diversity of purposes. We have seen summer cottages furnished almost entirely of willow ware—chairs, tables, sofas, lounges, etc. Large amounts of the raw material and the manufacture are imported into this country, principally from Germany, but within a few years the manufacture has been successfully prosecuted here on quite an extended scale.

One of the largest, if not the most extensive, manufactories of the osier, is at Hartford, Conn. It is one of the enterprises of the late Col. Samuel Colt, and consists of several large buildings for the work, and a village, the houses of which are imitations of Swiss cottages, giving a very picturesque aspect to the locality. The osier is grown upon the sloping sides of the dykes, built by Col. Colt to resist the annual floods of the Connecticut, upon the banks of which the manufactory stands. The osiers were first planted there principally as a protection to the earth work, a service they admirably perform, their roots forming a close network on the surface and penetrating the soil several feet, binding the whole mass completely together. For this property osiers are largely cultivated on the Holland dykes and sub serve a very useful design. In England they are employed in the formation of hedges, the pliability of the shoots rendering the formation of an impenetrable wattle feasible.

Direct Trade with Europe.

The experiment of direct trade between Europe and the Upper Lakes has proved so successful that it is now being constantly repeated, and, did our Provincial canals admit of it, would be carried on on a much more extensive scale by vessels of the largest tunnage. The mineral regions along the shores of Lakes Huron and Superior are even yet but partially known and tested; and we are satisfied that their full development in the process of time will give rise to an immense trade, much of which will be direct with Europe. Already we observe that the proprietor of the Bruce and Wellington Mines, on the north shore of Lake. Huron, has decided on having a large share of the copper shipped directly from the mines to England. A Mr. Taylor, of London, England, who is, we believe, proprietor of the Bruce and Wellington Mines, has been working them with such vigor of late, that the ordinary means of sending the copper from them to Europe *via* the Northern Railway steamers and road to Toronto, proves altogether insufficient. The steamer *Algoma* has been making regular trips all seasons (three times a month) between Collingwood and the principal points on Lakes Huron and Superior; and another steamer, the *Wabuno*, has also partially traversed the same route, but limiting her trips to the Sault Ste. Marie; and these two boats have, we are informed, had a very successful season, being loaded down with freight and passengers. The *Algoma*, which only accommodates some fifty passengers properly, has had to carry as many as ninety; and her freight, particularly on the return trips, is altogether more than she is able for, even with the aid of the *Wabuno*. The Bruce mines alone could frequently, we are told, load her with eight times the quantity she takes. This state of things has induced Mr. Taylor to open up direct trade with England. He has, we are informed, dispatched three vessels from London to the mines, the first of which arrived there last week after a very successful run. She carried some iron to Chicago and some coals as ballast, which latter she discharged at the mines, where she was, at last accounts, being rapidly loaded with her copper cargo for England.

This is one of the many evidences which come to hand of the growing magnitude of this Upper Lake trade, and it gives us great pleasure to chronicle the extension—gradual though it be—of the commerce of this great mineral and lumber region. Successive explorers have, time and again, repeated the story of the almost inexhaustible mineral wealth of this section, and we are glad to note each increased effort to develop its riches. In the export of breadstuffs and all the *et cæteras* of housekeeping to the mineral and lumbering districts hereabouts, as well as the carriage of passengers to and from the mines, several American steamers and sailing vessels now find remunerative employment, and there is room for more.

With its immense mineral, fishing, and lumbering interests, this upper country possesses a mine of wealth which has been hardly touched, and the richness of which, when fully developed, can scarcely be over-estimated.—*London Weekly Report on the Iron Trade.*

[It might be added that the productions of the Western Pennsylvania oil wells will soon reach Europe by vessels direct from Erie, Pa., arrangements having been perfected in Europe last winter by a committee of gentlemen from that city for the conveyance of the crude and refined petroleum direct from Erie to Liverpool and Bremen.—EDS.

Newspaper Enterprise.

THE NEW YORK DAILY SUN, the pioneer of cheap newspapers, comes to us in a much enlarged and improved form, with new type, etc. Its time-honored motto, "It shines for all," is handsomely realized in its present appearance. There are few newspapers that enjoy so large a measure of the public favor, or that are so truly adapted to the wants of the great industrial classes—the bone and sinew of the country. Its extremely low price, *two cents*, places it within reach of the humblest citizen, to whom it daily brings the latest and most interesting intelligence from all parts of the world. The same telegraphic news, word for word, including the dollar-a-letter Atlantic cable dispatches which are published with so much parade in the larger papers, is to be had for two pennies every morning in the *New York Sun*. This lively paper is a shareholder in the famous New York Associated Press, and therefore receives for publication duplicate copies of the telegraphic dispatches which appear in the other city papers. Who would pay four cents for news which they can always have for *two* in "*The Sun?*" Not the intelligent working people.

We observe with pleasure that Mr. Joseph P. Beach, long and favorably known in connection with the public press, is announced as Editor-in-chief of the *Sun*. Mr. Beach is one of the actiive, ndustrious workers who are always to be found at the post of duty, making their mark for good in the community, and striving to help forward, with noble vigor, the cause of humanity and truth.

Three Processes for Preserving Meat.

The perfect preservation of fresh meat in warm countries offers such a remunerative field to the successful inventor, that many methods have been proposed for its accomplishment. In an official report laid before Parliament on the preparation of beef in South America, for the English market, three methods, proposed by Prof. Morgan of the Royal College of Surgeons in Dublin, Baron Von Liebig, of Munich and Mr. Sloper, of London, are to effect this end.

Mr. Morgan's process is based on forced infiltration, using the circulatory system of the body as a means of introducing in the tissues of the animal, by injection, a preparation the constituents of which have not yet been made public. The process is simple and efficacious; by it an ox can be preserved in ten minutes, using from twelve to fourteen gallons of the fluid.

Liebig's process differs essentially from the former, for the meat, instead of being preserved whole, is reduced to an essence to be used in making soups. The concentration is carried to such an extent that thirty-three pounds of meat are reduced to one pound of essence, and the alimentary matter of an entire ox is contained in eight pounds of this preparation, making over one thousand basins of good, strong soup.

The remaining process, patented by Messrs. McCall & Sloper, professes to preserve meat in its fresh or raw state, arriving at market in the exact condition of butchers' meat just killed, but with an additional advantage of keeping twice as long as ordinary meat, after being exposed to the air. The curing process is based on the extraction of oxygen from the vessel in which the meat is packed. Tin cans are used in putting up the meat, in which a vacuum is formed to be filled by a certain gas, the composition of which is kept a profound secret. The only difficulty of this process, in some respects superior to either of the preceding, is, that the smallest opening in the tin case proves destructive to its contents, by allowing the gas to escape and the air to get in.

The Volume of Paper Money.

As there appears to be a conflict of opinion as to whether the volume of paper money afloat in the United States is increasing or not, we give the comparative figures from the latest authentic data:

	June 1, 1866.	Sept. 1, 1866
Legal Tenders	$564,140,458	$555,115,732
National Bank Notes	278,905,675	289,915,828
Fractional Currency	27,324,965	26,483,998
Total	$870,381,098	$871,515,559

It will seen from these figures, that while the legal tender currency has been reduced $9,024,726 and the fractional currency $850,967, during the last three months, there has been an increase of $11,010,-154 in National Bank notes. The amount of National Bank notes to be issued, before the $300,000,-000 prescribed by law shall be reached, is now about $10,000,000, after which we shall witness a gradual reduction in the volume of paper money, a consummation devoutly to be wished, as the decrease in volume will be accompanied by a corresponding increase in value of the circulating medium. The reduction in legal tenders since June 1st has been mainly in the compound interest notes, which, three months ago, stood at $162,012,140, and are now down to $155,512,140. The plain greenback circulation on June 1st, was $402,128,618, and Sept. 1st, $399,603,592. Fully one-sixth of the entire legal tender circulation lies in the vaults of the banks of this city, which at present hold the heaviest reserve in this legal tender form ever before controlled by the local banks. A year ago the legal tender circulation of the Treasury was up to $684,138,959. It has since been reduced nearly $136,000,000, or at the rate of close on eleven millions a month. The National Bank note circulation has been increased, during the year ending on the 1st of September from $177,487,220 to $289,915,829, or absolutely, $112,428,609, which increase is at the rate of less than nine and a-half millions a month, showing conclusively that, during the past year, the legal tender circulation has been diminished far more rapidly than the volume of National Bank notes has been augmented. A very considerable portion of

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the issue of National Bank currency through the year has superseded the circulation of State Banks, converted into National Banks or wound up altogether,so that it is safeto assume that the volume of paper money of all kinds in circulation has been materially lessened since Sept. 1, 1865. The compound interest legal tender notes have ceased to circulate from hand to hand, as money, and have now no other function to perform in our financial system, except that they are held as a reserve by the National Banks. On the whole, we think we have reached the maximum amount of paper money cirlation.—*Shipping and Commercial List.*

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening, Sept. 21, 1866, the President, Prof. S. D. Tillman, in the chair.

LIME IN THE PURIFYING OF COAL GAS.

When the approach of cholera was apprehended many complaints were made against the gas works of this city on account of the noxious odors arising from their premises, caused by emptying, for removal, the lime which had been used for purifying the gas. The evil was apparently remedied by inclosing the lime and conducting the odor through a pipe into the upper air.

The paper on this subject proposed the more effectual plan of thoroughly incorporating dried peat with the lime, thus absorbing the odors, when the composition might be sold as a fertilizer. It was remarked by the members that in London, during the prevalence of cholera, the workmen in the gas houses preferred taking their families there for safety, as no case of cholera had ever occurred among any employed there.

DYEING OF WOOD.

A communication to the Institute was read, describing a process for expelling air from the tissues of common pine wood, and injecting any of the aniline dyes. By this means lumber can be uniformly dyed throughout, in imitation of the valuable woods, and then wrought into articles of furniture.

VENTILATION AND RESPIRATION.

This was the regular subject for the evening, having been continued from the last meeting. The principle was then stated, that the rising of a balloon, and the draught of chimneys were owing simply to differences in gravity.

When the air comes in contact with the fire, the oxygen unites with the carbon, the nitrogen is released, it expands and becomes the vehicle by which the products of combustion are carried off, and this produces the draught of the chimney.

In the same way, the air is taken into the lungs, the increase of temperature expands the nitrogen, and this, again, carries off the products of the internal combustion. When the thermometer stands at 98 degrees, the difference between the external and internal temperature is not sufficient to produce breathing except under difficulty from the necessity of making use of some muscular exertion, and this causes the difficult breathing, particularly noticeable in young children.

In relation to ventilation, the trouble was not so much how to get the foul air out of a room, as how to get the fresh air in without incommoding any by having a current blowing upon them.

Where the top of the window is lowered, a comparatively solid body of cold air comes in and mingles with the heated air only to a limited extent; by dividing up this column of air, the mixing would be much accelerated, while no decided current would be produced. To accomplish this it was proposed to insert into the open window a board having a number of tubes connecting with the air outside. The subject was discussed pretty fully, but the hour for closing having arrived, further debate was adjourned till the next meeting.

BY an imperial edict, native Japanese artisans wishing to visit any of the various countries beyond the sea, for the purpose of learning any science or art, will receive permission from the Government on application.

[From the American Journal of Photography.]

Porcelain Process and Developer.

BY WILLIAM HADDOCK.

PORCELAIN PROCESS.—Some time since, I sent for this Journal an account of the use of a chloride collodion for negatives; and I now make another application of this chloride—for porcelain, that I wish you would try, and if it suits, give it to the fraternity.

Ether, 4 ozs; alcohol, 3 ozs; gun cotton, 40 grs; nitrate of silver, 32 grs.

Dissolve the silver salt in the water and add to the collodion; then add the chloride a few drops at a time, shaking until it becomes quite milky. Then add twenty-four grains of chloride of uranium, and eight grains of citric acid, dissolved in alcohol.

After coating the plate, and when dry, fume it, the same as paper, and you will find that it prints about as fast as paper, and is rich in tone.

I have an impression that it can be used for solar work in making large porcelain pictures. Why not?

For the preliminary coating, I use the following:

Albumen, 1 oz; ammonia, conc., 2 drms; water, 12 ozs.

And by the way, should you want to use this for negatives, put five grains of iodide of potassium in it, and you have a fine coating for negatives that will keep a long time, and will dry as hard as flint

DEVELOPER.—I see by the Journal, that a quick developer is wanted. I believe that the developer is one of the most important requisites of picture making.

I send you one, and also a print from a negative made with it. My aim has been to cheapen every thing I use, and at the same time to get good results.

I am using twenty-five grains of silver to the ounce for my paper.

The print sent was made with twenty-five grains. The paper had A. S. B. brand; you will see that the albumen is not affected in the least.

No. 1.—Water, 1 quart; sulphate of iron, 4 ozs; nitrate of potash, ½ oz.

Dissolve and add pure cider vinegar, 12 ozs., and 1 oz. sulphuric acid.

No 2.—Water, 1 quart; white of two eggs; and four drams ammonia conc. Shake up thoroughly and mix with No. 1.

Give about half the time you generally do in the camera; you can push a negative as far as you want without fogging, and it comes out promptly.

In using it for ambrotypes, I add a few grains of acetate of soda to four ounces of the solution, which takes out the free acid and removes the tendency to metallic luster.

It should be made about twenty-four hours before using it; then filter through cotton six or eight ounces at a time.

Circleville, O., Sept. 6, 1866.

The Throttle Valve.

Romancers are fond of contrasting the power of the locomotive with the apparently inadequate means of managing and governing that power. It is popularly supposed that a child can start and stop a locomotive. Possibly it may be so; but it is not the belief of those who have occupied the driver's position. Apart from the immense responsibility of the engineer of a train, a responsibility greater and more exacting than that of the conductor, there is a large amount of hard labor to be performed. Even the starting of a train is a labor. It requires something more than the "weight of a child's finger," as we have heard it expressed, to pull the throttle of a locomotive. It requires the exertion of considerable muscular power; and it seems as though the throttle valve might be balanced, so that it would not demand such a strain upon the wrist and the biceps muscle, to open the passage to the steam chests. The subject is worthy of attention, although it may appear trifling. It is no easy job to run one or two hundred miles every day, on a route where tho stations are but a few minutes apart, as every engineer of a train knows.

THE expenses of the London and North Western Railroad are 67 cents per mile, those of the Great Western, 70 cents. There are 150,000 men employed upon the railroads of the United Kingdom.

MISCELLANEOUS SUMMARY.

A GREAT fire is reported from Corsica, where the magnificent forest of Vizzabona caught fire a week before the last advices, and had been burning ever since. The vast forest, consisting chiefly of pine trees, celebrated for their immense yield of rosin, is now one vast sea of fire. Millions of valuable trees are destroyed, and as yet the efforts of the neighboring population have been ineffectual to arrest the progress of the flames. The damage is estimated at several millions of francs.

M. AUDIGER, a French chemist, has invented or discovered a new mode of embalming, which dispenses with all the repulsive details of the ordinary system. It consists in pouring down the throat of the corpse two glasses of a liquid, whose composition is still a secret. The operation lasts but twenty minutes, and in two or three months the corpse becomes as stone. Experiments have been made with this new method at Marseilles, Algiers, and in the public hospitals, with complete success.

AT the recent meeting of the British Association, a paper was read upon the introduction of a new gunpowder for heavy ordnance, in which nitrate of barytes is substituted for saltpeter in composition, the consequence being that the powder, when ignited, consumes more slowly, and the gases are developed less rapidly, while the same effect is produced upon the projectile as regards its ultimate velocity.

THE small crabs found on our Northern Atlantic shores, which are so largely used for bait for the blackfish and bass, are allied to the blue upland crabs of the tropical regions. They are said by some to be a delicious morsel. They seldom reach over one-and-a-half inches in length, and are known by the fishermen as "fiddlers."

AT present the copper mines of Arizona are attracting abroad more attention than the deposits of more precious metals. At Williams' Fork on the Colorado river, many valuable copper leads are located and a great deal of work has been done.

THE oil of the menhaden fish, which is caught in immense quantities on the coast of Rhode Island and the southern shores of Massachusetts, is coming largely into use as a substitute for the dark whale oils for curriers' use.

MATRICES for punches originally cut by William Caslon, in 1725, are now in daily use, as the old-faced type has again come into fashion.

THE stock and gold reports by the Atlantic cable to London, are first sold to subscribers, and only published in the papers two or three days after.

THE inventor of the needle gun has constructed a new rifle, a fac-simile of the old, but three pounds lighter, and made wholly of iron.

A RAILROAD is about being constructed between Chicago and Port Sarnia, C. W., to connect with the Grand Trunk Railroad at the latter place.

NEARLY five million letters and papers came to the United States from Great Britian in 1865.

A NEW iron truss bridge is to be erected at Pittsfield, Mass., across the Housatonic River.

A VESSEL has recently been constructed in Oregon having but one knot in her whole structure.

Submarine Photograph.

A French artist, M. Bazin, has been experimenting lately, with the design of obtaining photographs of sunken vessels, so that in attempting to raise the same positive knowledge can be had of their relative positions. To accomplish this M. Bazin descends to the necessary depth, in a strong sheet-iron box, which he calls his "photographic chamber." Thick glass windows afford every facility for making the necessary preliminary observations, and the picture is taken by the aid of a strong electrical light.

An unpleasant feature of the apparatus, and one which would not recommend it to pleasure seekers, is, that the operator is absolutely hermetically sealed, for no means are provided for supplying air, the chamber being constructed of a proper size to contain the quantity required during the ten or twelve minutes occupied in obtaining a negative.

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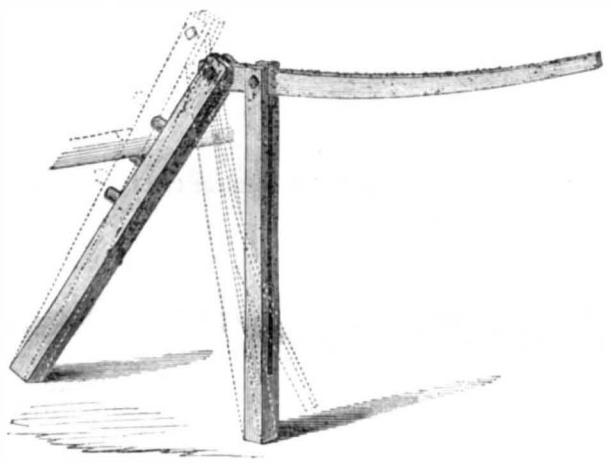
New Material for the Production of Gas.

A Mr. McKenzie, of Glasgow, Scotland, as we learn by Rylands' *Iron Trade Report*, has been experimenting by mixing the coal dust (bituminous) at the mines with crude petroleum, as a basis for the manufacture of illuminating gas. The result of his experiments is said to be very encouraging. The idea is that in the distilling of petroleum alone, a large quantity of the vapor is re-condensed into oil; but by combining the coal with it this waste is prevented, and a coke is left as a residuum which is superior to that from coal alone.

All this may be true, but as the same process has been fairly tested in this country without success, we take the liberty to doubt the professed result. What advantage there can be in the presence of the "coal gum," or siftings, for the production of gas, beyond that afforded by the oil alone, we cannot discover. If, as is stated, a portion of the vapor from oil in the process of distillation is re-converted into oil, "on coming in contact with a cool surface," the remedy is plainly a low distillation. As the oil alone is considered, in the article from which we derive these statements, as the gas-producing material, the coal is no better than any other substance to retard the condensation of the gas to an oleaginous liquid.

DUNN'S IMPROVED WAGON JACK.

A lifting jack that is light, portable, and self-retaining, when the weight is imposed upon it, is a desideratum. Most, if not all, of those in general use, must be secured by a pin or otherwise, when the axle of the carriage is raised, but the jack shown in the engraving is in this respect self-operating.



The two uprights are pivoted to the lever, and when the lever is depressed the position assumed is that shown by the dotted lines, the lever shutting into the mortise or channel of the main standard, and the weight of the axle and carriage holding the jack in position. Pins placed at varying distances receive the axle and support the weight. The operation of the implement can be easily comprehended by the aid of the engraving.

Patented July 24, 1866, by Albert Dunn, Plainfield, N. J. For territorial and manufacturers' rights, address Albert Dunn & Co., as above.

[From our own Correspondent.]

FOREIGN SCIENTIFIC NEWS.

The scientific societies of London have now all closed their sittings for the season, after the performance of no inconsiderable amount of valuable work. The recent discovery in Egypt of another stone, with an inscription in three different languages and styles of writing, including Egyptian hieroglyphics, has proved a great boon to philologists. It consists of a vote of thanks from the Priests of Memphis to one of the Ptolemies, in which respect it resembles the Rosetta stone in the British Museum—the stone which first threw light upon the inscriptions upon the monuments of ancient Egypt. On the newly-discovered stone the inscription is longer, and proves that Eastern scholars have been right in the interpretations they have fixed upon many unknown characters, in the absence of direct evidence. Such is the advance in this branch of knowledge that, in past numbers of *Good Words*, *Chambers's Journal*, and other periodicals, may be found translations of fairy tales written in the time of the Pharaohs.

M. De Waldeck, an old gentleman more than 100 years of age, who served under the first Napoleon, has recently returned from Mexico and Peru, where, for a long time, he employed a staff of Indians in excavating some of the remains of the ruined cities of Central America. He has brought back and exhibited at the Ethnological Society many exquisitely-executed drawings and paintings of the grotesque pieces of sculpture dug up under his supervision. Some of the screll work of the sculptures is very Grecian in its style, and the head of the elephant is frequently reproduced. Mr. Mackie, one of the members of the Ethnological Society, is strongly of opinion that some of the characters cut upon these remains are of Assyrian origin, but is little supported in his views by his colleagues.

All the numerous telegraphic cables between England and the continent of Europe are constantly so full of work, that the experience thus gained created great fears that the Atlantic cable, when laid, would be choked with messages, and thus be a slower method of communication than by post. For this reason there is little or no complaint in England about the charges of the Atlantic Telegraph Company, since "high charges" are synonymous with "great speed." Again, the Company for twelve years has had to fight with great disappointments and difficulties, and sunk nearly £2,000,000 of capital, with interest, in the undertaking. As the iceberg season off Newfoundland begins in February next, and lasts till August, during the whole of which time the icebergs yearly ground on the banks off the coast, the public can scarcely complain that the shareholders try to reimburse themselves before the time of greatest danger to the cable begins. The "certainty" of the apparatus used for transmitting messages by the cable is now a matter of public interest. Mr. Varley, considering the delicate nature of the receiving instrument, produces wonderfully sharp and unmistakable signals; still they have not the certainty of the Morse telegraph, which prints its messages; or of the needle telegraph, where the ear assists the eye in the work of reading. The little ray of light, like a bright vertical tongue of fire, sways to and fro upon the ivory scale of the galvanometer, and from its vibrations the messages are read, yet it is very desirable to test the certainty of the apparatus by sending through it a large number of figures and proper names, so that no aid in reading may be afforded by the context, and the reliability of the method of signaling be fairly tested.

On reference to the map of Great Britain, your readers will notice that at the extreme west of England is a magnificent harbor, Milford Haven, opening to the Atlantic as if to welcome visitors from America. Yet its shores are deserted, the great tide of traffic passes outside the mouth of the harbor, and bears northward to Liverpool, to encounter all the dangers of channel navigation, and to add to the number of black spots upon the wreck charts. The natural advantages of Milford Haven have never been economized, because the counties in its neigborhood are poor, without power to develop its resources, and, till lately, there has been little railway accommodation in the district. Within the past five years, two new lines have crept down to its shores, and the direct railway from Milford Haven to Manchester is in progress. The country in the neighborhood of the harbor is rich in anthracite coal, and the steam coal from the great Aberdare carboniferous basin is within easy distance by rail. At present the only signs of life at the Haven are a Government dockyard, and the town of Milford, which is nothing more than a miserable village, with a large percentage of uninhabited houses. The late First Lord of the Admiralty, the Duke of Somerset, declared that the great want of Milford Haven was dock accommodations, which private enterprise is now taking some steps to provide. Some of the Panama line of steamships have been sent by their owners to coal in the harbor, which, from its natural advantages, will probably, in the course of years, prove a great boon to all engaged in trade between England and America.

In my last, it was mentioned that a great body of archæologists, headed by the Marquis Camden, K. G., the Bishop of Oxford, and other gentlemen, had just invaded London to examine its ancient ruins and antiquities. They visited Windsor Castle, where Queen Victoria threw open to inspection every part of the building of interest, including some subterranean passages leading from the interior of the fortress, through the chalk rock, to the bottom of a shaft 35 feet deep, opening in the park, outside the outermost walls of the royal residence. The date of construction of these passages is not known. The archæologists also explored the Tower of London, under the guidance of Mr. G. T. Clark, the trustee and manager of the Dowlais Iron Works. Mr. Clark proved a most efficient cicerone, and in the course of his remarks narrated an unpublished anecdote of the late Duke of Wellington. At the time that His Grace occupied the position of High Constable of the Tower, he kept the public records in a room above the powder vaults. A literary gentleman, on making this discovery, hastened to the Duke, and asked him, "Whether he did not think it a very dangerous thing to keep the records on the top of the powder magazine?" The listener, who regarded the question purely from a military point of view, seemed startled at the suggestion, and replied, "Oh, I never thought of that before." He then mused for a minute, and brightening up he told the querist—"Well, perhaps it is not so dangerous after all, for I really don't think they will hurt the powder!" Mr. Clark piloted his party all over the ancient building, and at last, in the chapel in the White Tower—the chapel in which William the Conqueror and his rapscallions once knelt at their devotions, such as they were—the archæological students listened to perhaps the most instructive and eloquent discourse ever delivered within its walls. He told how Lady Jane Grey, Sir Walter Raleigh, and many others, had knelt before the rude altar in that chapel, and afterward dared to suffer and to die for the sake of opinions which they believed to be true. On the Tower Green, just outside the door, the noblest blood in Englnnd had been shed, and beneath a neighboring staircase had been dug up the bones of the two murdered princes. The whole atmosphere of the place seemed heavy with crime. Mr. Clark concluded with a few remarks about the Tower as a royal residence of the Plantagenets, who having lived out their lives of virtues and crimes, were carried forth to Westminster Abbey, where now they lie upon their altar tombs, with their weapons by their sides and their hands uplifted to heaven, peacefully awaiting the final resurrection.

W. H. H.

London, Tuesday, August 28, 1866

The Bremen Rose-Wein.

A correspondent to the *Nation* gives an estimate of the value of the famous Bremen rose-wein, which, in the year 1624, cost $165 per cask, and is now two hundred and forty-two years old. Calculating the original outlay at ten per cent compound interest, he states that in 1865 the value of each cask was $231,883,905,000, or nearly ninety times the present debt of the United States, while each bottle was worth $161,039,499, very nearly the sum realized from duties on imports in the United States last year. Each glass was worth $20,000,000, and each drop $20,000. We should think that this wine had been kept almost too long, and the owners had better "realize" soon, unless they want to lose on it.

A NEW system of small coinage, invented by Mr. Hall, of Buffalo, is now under consideration by the Government, with prospect of being adopted for future coins. The plan consists in having upon the center of the one-cent pieces a raised star, the nucleus of which is represented by a hole through the coin, the two-cent coins are to have two perforated stars, the three-cent coins, three.

IN Turkey, the income of the sovereign absorbs ten and eight-tenths per cent of the entire revenue. In England six-tenths per cent are applied for supporting royalty.

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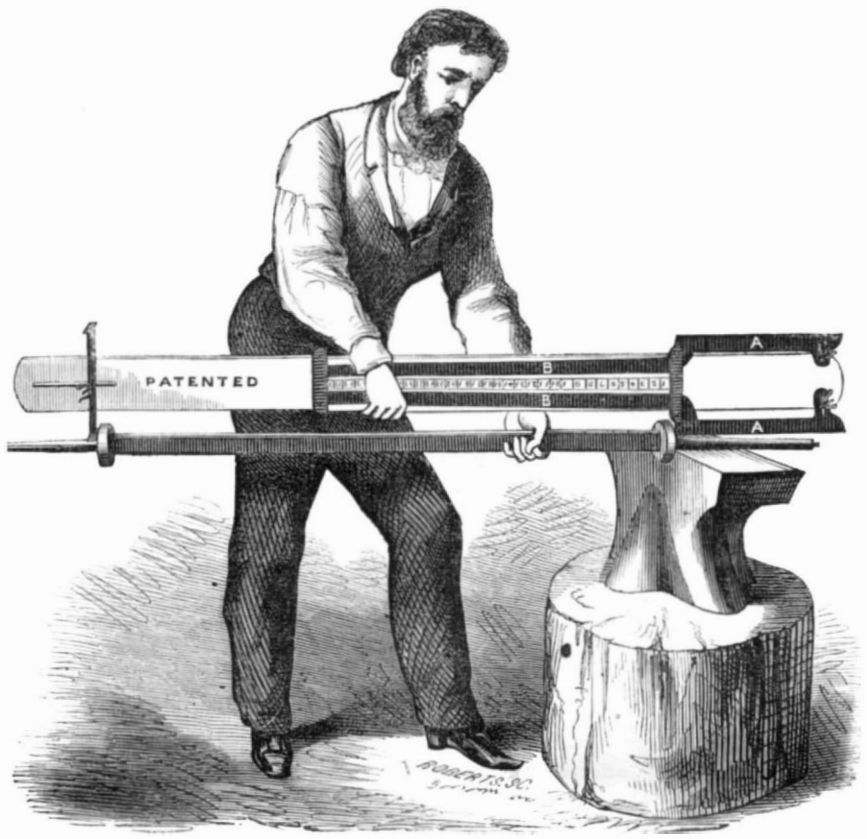
Improved Axle Gage.

It is surprising how much of the work on implements and machinery, the perfection of which depends upon exactness and absolute operation, is still intrusted to the unreliableness of manual dexterity, or determined by conjecture and guessing. "Practice makes perfect," is a generally received axiom, but not entirely and always correct. The most skillful workman sometimes makes a mistake, but where work is done by an unvarying gage there is no excuse for errors.

The engraving represents an implement designed to take the place of the guess-work by which carriage axles are now generally set. It is very important that the "dish" and "gather" of carriage wheels should coincide with the set of the axles, and this result is now attempted by repeated trials of heating, bending, and cooling the axle arm or journal, and swinging the wheels. It is claimed by the proprietors of this patent that, by the use of this gage, two axles can be set in the time now required for one, and that the work will be done much more accurately. The gage is simply a board, corresponding in length to the longest axles, and having two flat levers of thin iron, pivoted at a point representing the collar or washer of the axle. These levers are slotted at the end of the arm, A, through which slots pass bolts, having thumb-nuts designed to secure either in a fixed position. Opposite the arms, B, of the levers, on the board, is a graduated scale of inches and their fractions. At the other end is a cross arm, b, which, by means of a bolt and thumb-nut, can be moved through a slot in the board and secured at any point, the margin of the slot bearing a scale of inches.



BAMBERGER'S AXLE GAGE.

The operation is simple. The taper of the arm, or journal, is ascertained by callipering at the ends, and the long arms of the lever are moved inward a distance corresponding to the whole taper of the journal, at a point twice the length of the box or journal. This shows the taper of the journal. Then, at a distance corresponding to half the diameter of the wheel, set the lever out to a point equal to the "dish" of the wheel, and secure it by the thumb-nut. Now apply the gage to the axle, the dog, or cross arm, b, at the other extremity, resting against the opposite journal, at the collar or washer. This will show how much the axle journal is to be set, the short arm of the iron lever bearing against the surface of the journal when bent to position.

For the "gather" proceed with the lever on the opposite side, except that the second movement should be out toward the edge of the gage for the front of the wheel, and in for the back of the wheel. A movement of one eighth of an inch will give a "gather" of one-quarter, bringing the wheels one-half an inch nearer together in front than rear. Practical carriage makers will easily comprehend the advantages of this gage, which is absolute in its movements and always reliable.

Patented by W. C. Bamberger, Nov. 15, 1859. For territorial and manufacturing rights apply to Wilson & Dougherty, Box 623, Newark, N. J.

The Doctrine of the Correlation of the Physical Forces.

There are signs of some reaction against that doctrine of the correlation of the physical forces which for the last twenty years has so dominated scientific thought, or, at least, against that interpretation of it which makes it teach that all forces are modifications of one force, and are mutually convertible into each other. Thus, in the last number of the "Quarterly Journal of Science," a mention, in an article on "De la Rue and Celestial Photography," of the appearance in the photographs of the solar eclipse of 1860 of solar prominences invisible to the human eye, calls forth the following very noteworthy remarks:—"A curious question arises from the consideration of the chemical power evidently possessed by these prominences, be they flames or clouds. We never, as we have already stated, under ordinary circumstances obtain an impressed image of the sun without finding the indications of a protected circle—that is, one which proves a paucity of chemical power—surrounding the photographic disk. Yet, when the light of the solar disk is interrupted by the body of the moon, the radiations proceeding from the edge, or rather, perhaps, from beyond it, have a strong photographic power. What is the cause of this most remarkable difference? Why is it that the photographic tablet is impressed during an eclipse by objects which do not give light enough to be visible even at the period of totality, and that they do not effect the required chemical change upon our sensitive plates when the sun is unobscured? The only reply which we are at present in a position to give is that the diffused light when the sun is shining is sufficiently powerful to overcome the weaker chemical radiations of those solar clouds or flames. If this reply approaches correctness, we have additional evidence confirming the view that the two principles existing in the sunbeam, light or luminous power, and actinism or chemical power, are not modifications of the same 'energy,' to use the accepted term of the day, but rather forces balanced against each other, acting indeed in antagonism." Are our men of science coming round to the doctrine of Swedenborg and other "mystics," that there are two primary forces, and not one only—one attractive and the other repulsive.—*Mechanics' Magazine.*

Whence Comes Indigo?

There are some fifty or sixty species of plants of the order *leguminosæ* and genus *indigo-fera*, which, by undergoing a process of fermentation, yield the beautiful dye known as indigo. These plants are indigenous in Asia, Africa and America, and in some of the East and West India islands. The discovery of the dye was very ancient, its use being mentioned by more than one of the ancient Latin writers, and in terms which make it very certain that it was the same that is now so well known by the name. It was very early produced in India, from which country the name was derived, as it was called Indicum, and this is the country in which it is now most extensively cultivated and prepared. Its importation into several European countries was for a long time prohibited, for various reasons; in England and France because it was thought to injure the texture of the cloth in dyeing. In Germany it was prohibited for the sake of protecting the native woad, a miserable substitute for the genuine article—a distinguished instance of the wisdom of those who are desirous of protecting home productions without any regard to their comparative value. On the same principle the advocates of this system ought to exclude from our own country yellow dyes, for the sake of protecting the well-known native dye made from butternut bark. The plant from which indigo is commonly produced grows to the hight of from four to six feet. It contains the coloring principles in the leaves and stems in a colorless fluid, which is changed to the dye by fermentation and oxidation. The seeds are sown in March or April, and before the plants attain their full growth, the same season, they are cut early in the morning, before the sun has fallen upon them, and carried to the factory, where they are laid in great stone cisterns, some twenty feet square and about three feet deep. Heavy weights are placed upon them by which they are kept down below the surface of the water, which is let in so as to cover the plants, and fermentation is allowed to go on for ten to fourteen hours, according to the condition of the plants, the temperature, etc. The liquor is then in an active commotion, very much as if it were boiling. Bubbles of air continue to rise, which assume a purple hue, indicating that the fermentation has had the effect of producing from the limpid water the color desired. When this process is complete, the water is drawn off into another vat, where it is violently agitated by artificial means for an hour or two, until the coloring matter begins to be precipitated, and it is then left to settle. The water is drawn off again, and the indigo is taken out, dried and prepared for commerce.

The cultivation of the plant and the preparation of indigo, wese commenced in South Carolina about the middle of the last century, and have been kept up ever since until the commencement of the late war, which interrupted so many of the Southern productions. At one time the finest indigo in the world was made in that State, and it was greatly sought after by dyers, calico printers, and leather dressers, but both the quality and quantity fell off many years since, and the yield, for some time past, has been inconsiderable. The finest quality now comes from Bengal and the adjacent provinces. There are many grades, according to commercial language, such as superfine, pure blue, ordinary blue, fine purple. The finest quality has the least specific gravity, and floats upon the water; the poorer qualities having an admixture of earthy substances which add to their weight. The finest indigo may also be tested by its not readily leaving a mark on drawing it when dry across a piece of paper, and also by the clear blue which it imparts to water when dissolved. The culture of the plant is quite precarious, and the amount produced varies greatly from one season to another. The total shipment from the East Indies averages 12,000,000 lbs. per year. Last year there was imported of this first quality into the United States 415,575 lbs. valued at $324,207—its foreign gold cost.—*Exchange.*

THE British mint has ceased to coin half-crowns for some years past. In like manner, the four-penny piece is made to give place to the three-penny, no coin of the former denomination appearing in the returns since March, 1855.

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Correspondence

The Lightning Rod Question.

MESSRS. EDITORS:—In No. 11, current volume, SCIENTIFIC AMERICAN, is an article entitled "Insulation of Lightning Rods." I am surprised that you allowed such an article to appear in your paper, as it is a subject that should not be laid blindly before your readers, for it may cause a great deal of mischief. S. D. C. says lightning rods must not be insulated. But where are his proofs? I say a rod that is not insulated is worse than useless; my proof is that several houses that have been struck in this city, although armed with rods, showed, on examination, that the insulation of the rod was imperfect; and, on the other hand, where the rod that was put up to protect the building was well insulated, when struck by lightning it proved a complete protection. The Burnett House here, for instance, has a rod that was struck, and the platinum points with which it was armed were completely melted, but the house was safe, the rod was well insulated. Also Mr. Diehls' establishment for manufacturing fireworks, situated on Mount Adams, received a heavy charge; the rod was insulated and saved the building. No rod should be put up without being insulated, and Franklin says so, S. D. C. to the contrary notwithstanding.

S. D. C. says rods should be in connection with gutter spouts. That is a very good arrangement when the rain is falling and the water running through the spout, for then the water will carry off the electricity that would otherwise go into the house, as likely as anywhere else; but as rods often receive a charge before any rain falls, it is best to trust to the rod alone, for if the rod is in connection with anything else which is a good conductor, that does not lead to the ground, the lightning will be compelled to take some other course to get to the ground, and then there is no telling where it will go, or what damage it will do before it is spent. In proof of this, I will give an instance. The cross which surmounts the steeple of the Cathedral in this city, was put together with an iron rod that passed through it. The conductor was well insulated all the way down, but one of the fastenings that held it to the cross came in contact with the iron rod that held the cross together. This rod was struck, the lightning ran into the cross, on the iron rod running through it, but it could go no further. The consequence was that the cross was split into fragments, and as the steeple is one of the highest in the city it was no easy thing to replace it.

The whole trouble is that people will get the cheapest rods that can be had. It is better to pay for a rod that is large enough to conduct any amount of electricity that it is likely to get, and have it well put up by some one that knows his business. S. D. C. talks of safety valves. The comparison is not at all analogous. F. F. S.

Cincinnati, Ohio.

[Our correspondent's strictures on the publication of contributions, are not entirely just. We are in no way responsible for the opinions of correspondents, and on this subject of insulation, men equally well experienced hold opinions diametrically opposed. Our object is to allow both sides to present their differing views, and thus by a courteous discussion eliminate the truth.—EDS.

Mechanics Needed.

MESSRS. EDITORS:—Owing to natural and accidental causes, mechanics are many times compelled to move their base of operations to some more eligible point, where they can get supplies at more reduced prices and in greater abundance. To such, I would say that this point offers extraordinary inducements, and invite their attention to the following facts: We are situated about midway between St. Louis and Cairo, on the east bank of the Mississippi, with an immense extent of the finest farming land in the United States back of us. We have large beds of coal within fourteen miles of us, from twenty to one hundred feet below the surface, and from three to seven feet vein. The St. Louis and Iron Mountain Railroad strikes the mine some 40 miles above here, and the ore could be brought by barges to this point very cheaply. We have an abundance of the finest kind of timber—such as oak, black walnut, ash and all kinds of hard wood. Land is cheap, the climate is healthy, and all kinds of fruits abundant. For a manufactory of agricultural implements, or a machine shop and foundery, this place offers superior inducements.

Any further information in regard to the subject will be willingly given. We need mechanics and we are willing to do all we can for them.

C. B. COLE.

Chester, Ill., Sept. 4, 1866.

Effects of Sunshine on Fire.

MESSRS. EDITORS:—In reading your article on the "Effects of Sunshine on Fire," in your issue of Sept. 8th, I notice in the summary of Prof. Horsford the following:—

"Sixth, That the very diminished draft of chimneys in very hot weather, when the general atmosphere is at rest, and the sunshine intense, is due to upward currents on the outside of the house, arising from the heated surfaces of the roof and walls; which currents, by friction, draw outward through cracks and open doors and windows, the air from the interior of the house, and so lessen the pressure within and overcome the draft of the chimney." In describing the circumstances, he mentions that "the roof of the house was of dark slate" and exposed to the heat from 11 A. M. till 3 P. M.

Could not this occurrence be accounted for as follows? The draft of a flue or chimney being caused by the difference in weight of hot and cold air, did not the heated air rising from the roof surround the chimney? And was there not so little difference in temperature between the air from the range rising within the chimney, and the air from the roof rising without the chimney that a sluggish draft was the consequence; until, later in the day when the roof became cool and a better draft would result?

J. WENDELL COLE.

New York, Sept. 17, 1866.

Concrete for Building Purposes.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN of Sept. 1st, C. W. C., of Mo., under the head of "Notes and Queries," is wrongly informed as to the relative strength of stone, brick and concrete for building purposes. You will see in "Gillmore's Report on Hydraulic Cements and Mortars," at page 225, article 447, the following, which I think would be the correct reply to your correspondent:—

"Concrete is admirably adapted to a variety of most important purposes, and is daily growing into more extensive use and application. For foundations in damp and yielding soils, and for subterranean and submarine masonry, under almost every combination of circumstances likely to occur in practice, it is superior to brick work in strength, durability and economy, and in some exceptional cases, is considered a reliable substitute for the best stone, while it is almost always preferable to the poorer varieties."

The work of Mahan, which you quote in your reply to C. W. C., is strangely incorrect on the subject.

R. K. D.

New York, Sept. 18, 1866.

[In the case alluded to, C. W. C. inquired as to the relative strength of stone, brick, and concrete for a church, 40 by 80 feet and 25 feet high to the eaves. It will be seen by the quotation from "Gillmore's Report" that he does not recommend it for open air structures, but for "foundations in damp and yielding soils, and for subterranean and submarine masonry." For these purposes the value of concrete, made of stone and cement, is indisputable.—EDS.

THE Italian gold mines are producing gold to an extent that has justified the introduction of new and improved machinery. In July last the product of three mines amounted to 1,511 ounces, valued at about $20 per ounce, all of which was transmitted to London.

THE Geographical Society, of St. Petersburg, is making preparations for a scientific expedition, for tracing the course of the river Yenisei up to its mouth in the icy sea.

NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees:—

CULTIVATOR.—ANDREW STARK, Topeka, Kansas.—This invention relates to a new and improved cultivator for cultivating those crops which are grown in hills or drills, and it consists in a novel arrangement of a seat frame with the plow beams of the device, whereby the plows are placed under the complete control of the driver. The invention also consists in a novel manner of constructing and arranging the frame of the device and the draught pole, whereby a very simple, strong and durable device is obtained.

TRUNK.—A. V. RYDER, New York City.—This invention relates to a new and improved trunk, of that class which are provided with drawers, and it consists in constructing the trunk in such a manner that the drawer is rendered very accessible and, when the trunk is open, the drawer will not interfere with the other portion of the trunk. This invention, it is believed, is superior to other trunks provided with drawers, in consequence of all the portions of the trunk being accessible when the trunk is open, all the drawers being exposed, so that they may be drawn out, and the lid of the other portion raised without the necessity of removing or detaching any parts.

CAR COUPLING.—HOMER ADKINS, Plymouth, Ill.—This invention relates to a new and improved car coupling, of that class which are commonly termed self-acting or self-coupling, and it consists in a novel means for holding up the coupling pin in one drawhead, whereby the other drawhead, which contains the link, may, when the two drawheads came in contact, release the coupling pin, so that it may drop through the link, provision being also made for holding the link so that a coupling of the two drawheads may be effected or not, as desired.

MACHINE FOR CUTTING THE CORNERS OF PAPER FOR THE MANUFACTURE OF PAPER BOXES.—DANIEL WHITLOCK, Newark, N. J.—This invention relates to a new and improved machine for cutting out the corners of rectangular pieces of paper for the manufacture of rectangular paper boxes. The invention consists in a novel construction of the knife or cutter, whereby the same is made to work in proper position at all times, being prevented from getting out of place under the resistance offered to it by the paper. The invention also consists in the employment or use of an adjustable bed and in graduating the bed so that by means of adjustable gages, used in connection with the bed, the openings at the corners of the pieces of paper may be cut larger or smaller, as occasion may require.

PUMP FOR DEEP WELLS.—J. W. SUMMERS, Tarr Farm, Pa.—This invention consists, among other things, in suspending or attaching the piston of a pump to its rod by means of a ball and socket joint, or its equivalent, in contradistinction from a rigid or fixed joint, whereby the piston is allowed lateral play in the pump cylinder so that it can easily yield in any direction when the pump tube or the cylinder is deflected from a right line.

STITCHING CLAMP FOR HARNESS MAKERS.—W. M. MCCOY, Bloomingdale, Ind.—This invention is designed for the use of harness makers for holding rolled work while stitching the same; and it consists in a device provided with a grooved bed for the work to lie in, and at either end with a band, or its equivalent operated by a set screw for holding the work firmly while being stitched.

BLOW PIPE.—JOSIAH MCFARLAND, Clinton, Ill.—This invention consists in applying an air chamber to a force pump, and to a flexible pipe with a fine-pointed mouth piece, in such a way that by means of the pump the chamber is filled with compressed air or gas of any character, when, by closing suitable cocks, the same can be confined and retained therein and the air chamber taken off and carried to the place where the blow pipe is to be used and by the action of the air or gas a powerful blast obtained without the labor or agency of the operator.

SKATE.—M. FLEISHER, Philadelphia, Pa.—This invention relates to that class of skates in which the skates are secured to the boots by means of clamps brought to bear against the edges of sides the sole and heel, and it consists in a novel arrangement of the said clamps.

MACHINE FOR BORING OR CUTTING KEY SEATS.—JOHN K DIENER, Honesdale, Pa.—This invention consists in a novel manner of arranging the cutting tool of the machine, whereby the tool can be so adjusted or set in position and so regulated as to cut a key seat with an inward or outward incline or in a parallel line with the central axis of the car wheel, crank, or other device in connection with which it is being used.

HOISTING APPARATUS.—GEORGE L. HOWLAND, Topsham, Me.—This invention relates to an improved hoisting apparatus, by means of which weights may be raised or lowered to or from any desired elevation; which will occupy but little space, and be easily transferable from one place to another.

SAFETY POCKET.—JAMES T. CHAMBERS, Utica, N. Y.—This invention consists in so constructing a pocket, that a watch or any other article placed in it cannot be abstracted or removed without the knowledge of the possessor or wearer.

SHIRT BOSOM.—C. F. PIDGIN, Boston, Mass.—The objects of this invention are to increase the flexibility of the bosom so as to allow it to yield or give to the backward or forward motion of the wearer; to diminish its cost; and to make it lighter.

WELL.—D. P. CHESBROUGH, Lansingburgh, N. Y.—This invention consists in so attaching to a well-tube, below its waste-water pipe, a reservoir or receptacle for the waste water escaping or flowing from the pipe, that such water can be reconveyed or conducted back into the well-tube.

SAW MILL.—GEORGE W. CODDINGTON, Middletown, Ohio.—This invention has for its object to furnish an apparatus for supporting the middle part of the log while being sawed, so that it may be prevented from bouncing and jumping, enabling the saw to be run at full speed from one end of the log to the other without its being necessary to check the speed of the saw, or alter or take off the feed when approaching the middle of the log or carriage, as is now the case.

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SADDLE.—JACQUES MEYER, Williamsburgh, N. Y.—This invention relates to the construction of saddles, and consists in combining new materials in the manufacture of the article for securing greater strength and durability, and hanging the stirrups and straps in a convenient manner for shifting lengths and detaching them readily from the saddle.

SHOVEL PLOW.—WILLIAM H. LUCE, Hampton, Ill.—This invention consists in providing a shovel plow for the purpose of eradicating weeds and loosening up and pulverizing the ground around corn, potatoes, and other crops, which are sowed or planted in drills or rows.

WATER-PROOF COMPOSITION.—SAMUEL B. B. NOWLAN, New York City.—This invention relates to a new and improved water-proof varnish, which is to be applied to all kinds of textile fabric, paper and other substances. The said varnish is said to have no injurious effect on the fabric to which it may be applied, and not to be liable to spontaneous combustion. The claim was published in our last week's issue.

MACHINE FOR CLEANING WHEAT AND OTHER GRAIN.—BENJAMIN BARNEY, Time, Ill.—This invention relates to a new and useful machine for cleaning wheat and other grain, and it consists in the employment or use of a rotary fan, vibrating shoe containing a riddle, cockle screen, and a chute, and a suction blast spout, provided with a valve, and arranged with the fan and shoe in such a manner that wheat and other grain may be cleaned very expeditiously and in a perfect manner.

ALARM MOVEMENT.—J. E. BUERK, Boston, Mass.—This invention consists in an alarm movement, from the escapement of which extends a stop lever, which bears against a segmental disk mounted on a shaft, to the upper part of which is secured a serrated segment in such a manner that by turning the serrated segment either by hand or by the action of a watch or other mechanism, until the flat part of the segmental disk faces the stop lever, the escape wheel is released, and the alarm begins to sound.

FEED-WATER HEATER.—GEORGE HASECOSTER and JACOB STEPHENS, Richmond, Ind.—This invention has for its object to furnish a means by which the water to feed steam boilers may be heated, and the lime which may be in it be deposited before it is introduced into the boiler.

DRILLING MACHINE.—ROBERT NUTTY, New York City.—In the machine embraced in this invention the drill or drills are so hung and arranged that whether to operate or work against the face of the quarry or rock in a vertical, horizontal, or in any plane between the two, it can be readily adjusted and brought to the proper position therefor, and, when in any of such positions, be operated in the desired manner.

CULTIVATOR.—SAMUEL P. ETLER, Scotland, Pa.—This invention consists in so constructing a cultivator that by means of compound levers the plows may be shifted from side to side between the wheels, and by means of other levers the plows may be elevated out of the ground so that the cultivator may be conveyed from place to place without the teeth or plows coming in contact with the ground.

PLOW.—F. M. MCMEEKIN, Morrison's Mills, Florida.—This invention relates to a new and improved plow, and it consists in a novel construction of the same, whereby a very strong and durable plow is obtained—one which may be manufactured at a reasonable cost, and be capable of having different molds attached, as circumstances may require.

CULTIVATOR.—D. J. NOBLE, New Boston, Ill.—This invention relates to a new and improved cultivator of that class designed for cultivating crops grown in hills or drills, and it consists in a novel arrangement of the two inner or laterally moving plows, and also in a novel adjusting device for the plow frame, whereby it is believed that the laterally moving plows may be operated with greater facility than hitherto, and all the plows made to penetrate the earth at a greater or less distance as may be required, and retained or held down in the ground the required distance, and at the same time be capable of being adjusted with the greatest facility.

ARCHED IRON BRIDGE.—JOHN H. GILBERT, Roxbury, Mass.—This invention has for its object the production of a much stronger bridge out of a much less amount of material, and, consequently, at a much less cost than has heretofore been done.

CHURN.—WILLIAM BURSON and D. C. BURSON, Salineville, Ohio.—This invention consists in the peculiar construction of the dasher, and in the combination of a perforated gathering board with the box and dasher of the churn.

MECHANISM FOR SEPARATING GRAIN AND OTHER SUBSTANCES.—JOHN S. BODGE, La Porte, Ind.—This invention is designed as an improvement on that kind of separators the screens or sieves of which are provided with covers constructed and arranged in such a manner and in such relation with the screens or sieves as to prevent the longer or broader grains, seeds, or other particles or substances to be screened or sieved, from assuming an oblique or perpendicular position while passing over the screens or sieves, and thereby compelling said longer or broader grains, seeds or other particles to pass over the screens or sieves flatwise while the shorter, smaller and narrower grains, seeds, and other particles are permitted to pass through the screen or sieves when the latter are in motion.

MACHINE FOR POUNCING HATS.—EMILE NEGARET, Newark, N. J.—This invention relates to a machine by which the operation of pouncing the brim and also the body and crown of a hat can be performed with the greatest ease and facility and with very little hand labor. The brim of the hat is secured between two conical pressing rollers which carry the same through between two spring jaws, the faces of which are covered with emery or sand-paper, or other suitable material, and the hat is guided in its motion by an angular guide-piece, in such a manner that by imparting to the conical pressing rollers a rapid revolving motion, the brim of the hat is carried through between the spring jaws, and the operation of pouncing the same is effected without exertion, and in a short time.

FASTENING FOR GATES.—POMPEIUS PHILIPPI, Beardstown, Ill.—This invention consists in having the upper bar of the gate extend a suitable distance beyond the batten or upright at its free or unhinged end. or, having a bar extend from the batten or upright, to catch into or over a hook attached to the gate-post, and using in connection therewith a lever or levers and a rod, arranged in such a manner that, by adjusting or operating the levers, the unhinged end of the gate may be raised and lowered with the greatest facility, and the projecting bar made to catch into the hook, or be raised out of it in order to fasten or unfasten the gate, as may be required.

MOLDER'S FLASK.—E. C. LITTLE.—This improvement consists in a cast-iron frame for molder's flasks, constructed with hinges and pins peculiarly fitted for connecting the cope and drage so that they are adapted to a match-plate, without producing any lateral movement to disturb the pattern.

CORN HARVESTER.—S. SECRIST.—This invention is designed as a labor-saving implement for cutting and gathering indian corn and sugar-cane, and leaving the stalks standing in shocks as the machine travels over the field, making clean and expeditious work.

STRAW CUTTER.—S. PETTIBONE, Corruna, Mich.—This invention consists in the combination of a fly-wheel with the lever to which the knife of a straw cutter is attached, and by which it is operated; also, in the adjustable bearing in which the shaft of the fly-wheel runs, which is constructed in such a manner that it may be moved up or down, as may be desired.

COMPOSITION ROOFING.—JAMES G. HOLLIDAY, Wheeling, W. Va.—This invention consists of a composition roofing, formed by combining coal tar, still bottom of petroleum, acid tar, finely-ground brick clay, and refuse lime from gas house, with each other.

STEAM GENERATOR.—E. P. CHASE, Rockland, Me.—This invention relates to a steam boiler, in which a water-heater and a series of steam superheating pipes are combined with the generator. The water is drawn from the heating tank and injected into the generator by means of a pump of any desirable construction, and a self-acting regulator governs the supply of water drawn by the pump, according to the pressure of steam existing in the generator. After having been drawn from the tank the water is injected in the form of a fine spray into an annular generator which is exposed to the direct action of a fire, and by these means the water instantly flashes into steam, which passes through a serpentine pipe, or through a series of pipes, in the space or flue surrounded by the annular generator, where the same is superheated, and whence it passes off to the engine or to the spot where it is to be used.

BURIAL CASE AND COFFIN.—JULIAN A. FOGG, Salem, Mass. Patented Sept. 4, 1866.—This invention consists in an improved manner of constructing coffins, whereby the same are made very durable and are prevented from falling to pieces before the wood is decayed, and the invention consists further in a new manner of securing a glass plate to the cover of the coffin, whereby the face of the corpse is displayed, and also in an improved manner of arranging the plates. In the claims of this case, which were published in our last week's issue, the inventor's address is given at Cheshire, England, but it should be Salem, Mass.

PETROLEUM TANKS.—Much attention has been directed to contriving vessels for the storage and transportation of petroleum, and a score of patents have been issued for compositions for rendering barrels impermeable to the liquid, while other inventors have devoted themselves to contriving metallic tanks, which are easily rendered impervious, but are subject to casualties from the expansion and contraction of their contents. When tanks or large vessels are used, it becomes necessary to provide against the "swashing" of the liquid therein, and about a dozen patents have been issued in which inventors have endeavored to reconcile two apparently opposite conditions: a full tank in which the liquid would not "swash," and one which would not be injuriously affected by expansion and contraction of the liquor. In the patent of Church & Knight, Sept. 11, 1866, an auxiliary chamber is provided, into and from which the liquid of the main chamber flows under alternate expansion and contraction. The means of communication between the two chambers is a bent tube whose open ends are beneath the surface of the liquid in the respective chambers, so that the liquid may flow from the full chamber to the smaller one as it expands and return when it contracts, without the admission of any air to the main chamber. A single plate and a pipe as long as twice the diameter or depth of the tank is all the addition required to provide tanks with this safety arrangement. Address Jas. L. Ewin, Lock Box 39, Washington, D. C.

COMPASS SCALE.—JOHN REID, Knoxville, Md. Patented Sept. 11, 1866.—A scale is furnished with a compass, which will indicate, by the needle, the position of the ruling edge of the scale. The compass is capable of rotation in a horizontal plane, and has an index and vernier to permit its adjustment to correspond to the variation.

Notes and Queries

A. L. W., of N. Y.—Vulcanized india-rubber cloth will bear a temperature of 160 deg. for a time. The kerosene stoves with a chimney at one end, operate very well. We have tried one thoroughly. They are for sale on Broadway.

———, of Mass.—For keeping the valves of a fire engine from freezing in winter, we know of nothing so efficient and unobjectionable as that which you suggest—glycerin. From some experiments made, we believe it will serve your purpose. Try it next winter.

G. A. H., of Ind.—Your small steel rollers can be polished as well as "tried" after hardening, by the use of "blue stone," or "Scotch gray" stone, secured in a support which will not allow it to follow the depressions of the roll. Holding a piece of the stone firmly on a rest will suffice. Any fine grained stone that does not scratch will do to bring the rolls to a surface. The lathe should not run fast enough for polishing. The whole secret is patience. This is what makes these fine rolls cost.

W. R. and A. E. H., of C. W.—To give you a diagram for setting your slide valve, would necessitate the preparation of engravings, which would entail too much expense. Full directions in regard to this subject can be found on pages 51 and 70 of Vol. XIII, SCIENTIFIC AMERICAN, current series. We think, however, you are striving after a mechanical impossibility, if we understand your query.

F. M. R., of Pa.—The Atlantic cable of 1858 is known to be imperfect. We are not informed whether the Company intend to raise it. It is not expected that it would prove to be in a serviceable condition for an ocean cable.

W. H. S., of Pa.—Coke is generally supposed to be capable of producing a hotter fire than anthracite. The intensity of heat is proportioned to the amount of combustion in a given space. The fuel which burns the quickest should give the hottest fire.

E., of Md.—If an empty bottle be corked and then sunk in deep water, the pressure will force the water into the bottle so as to fill it. But the water will enter through the neck, the cork will be condensed and generally will be inside of the bottle when it is drawn up. Glass is impervious to water. . . . . The water at the bottom of the ocean is as quiet as the grave.

A. P. L., of N. Y.—Emery for coating a polishing wheel needs no preparation. Select the grades you need, spread the emery on a board, or table, coat the periphery of the wheel with hot glue, and, by means of a stick through the center, roll it back and forth over the emery. You can, however, purchase a vulcanite emery wheel, which will be superior to any you can make.

J. C. E., of Ohio.—Coat your cast iron screws with plumbago, or blacklead, instead of molding sand, and you will probably find little difficulty in casting a nut upon them.

J. H. L., of Wis.—After years of experience as an editor, testing gum arabic and gum tragacanth, we think nothing is better for paper pasting than common starch. It should be macerated, or dissolved, in hot water, and will keep longer than anything else we know.

SPECIAL NOTICES.

Warren W. Dutcher, of Milford, Mass., and Sarah Dutcher, administratrix of the estate of Elihu Dutcher, of Waukesha, Wisconsin, having petitioned for the extension of a patent granted to the said Warren W. Dutcher and Elihu Dutcher, on the 28th day of Dec., 1852, for an improvement in temples for looms, it is ordered that said petition be heard on Monday, the 10th day of December next.

Jearum Atkins, of Mokena, Ill., having petitioned for the extension of a patent granted to him the 21st day of December, 1852, for an improvement in rakes to grain harvesters, it is ordered that said petition be heard on Monday, the 3d day of December next.

Interesting Decision—Combination Tools are Patentable.

BEFORE THE EXAMINERS-IN-CHIEF ON APPEAL.

Foote for the Board.

Application for a Patent for a Combination Tool.

The Examiner, in denying the application in this case, states: "The tool, as described and shown, is an aggregation of four distinct tools answering to four different purposes, some widely dissimilar and others analogous; but in no particular does anyone of these tools add any value to either of the others, or co-operate therewith to effect a common purpose, and hence no combinable relationship exists between them."

In Beach's application for a patent for combining a sharpener with a fork, we came to the conclusion that the principle above referred to did not apply to such a case; and the present one, we think, is like it. It is often a matter of great convenience and utility to combine several tools in one, or, more properly perhaps, make the same tool perform their different offices; and invention directed to that object is entitled to the reward of a patent, as much so as any other subject of invention. A great many patents have been granted for such combinations, as a sword and pistol, a bureau and a bedstead, a theodolite and a compass, a saw and a square, that have no co-operative action, and we are not aware that any of them have been held invalid for that cause.

The Examiner refers also to another ground of objection, as follows: "The same patent cannot be for a combination of different machines, and for distinct improvements in each."

The words quoted are from the decision of Judge Story, in Moody vs. Fiske, et al. (1 Mason, 119), and are in accordance with an opinion by the same learned Judge in the previous case of Barret vs. Hall (1 Mason, 447). These cases were under the act of 1793, and in both, the language quoted was rather a general remark than the decisions of the cases. The language was explained and qualified in the subsequent case of Wyeth vs. Stone (1 Story, 291), in which Judge Story says:—"It is, perhaps, impossible to use any general language in cases of this sort, standing almost upon the metaphysics of the law, without some danger of its being found susceptible of an interpretation beyond that which was then in the mind of the court. The case intended to be put in each of these cases was of two different machines, each applicable to a distinct object and purpose, and not connected together for any common purpose."

And afterward in Pitts vs. Whitman (2 Story, 621), the same Judge decided directly—"There is, in my judgment, no difficulty in maintaining the validity of a patent (as in the present case) for a machine combining several distinct improvements, each of which is the invention of the patentee, and also of including in the same patent a right to each of these several and distinct improvements. In other words, the patentee may, in such a case, take out a valid patent for the combination, and also include therein a right to each distinct improvement severally contained in the same machine."

The same principle was affirmed by Mr. Justice McLean in Root vs. Ball (4 McLean Rep., 180), "the same patent may include a patent for a combination and an invention of some of the parts of which the combination consists."

Since the decision of these two cases it has been a very common practice to include in the same patent claims for the combination and for the parts of which it is composed, and suits upon such patents have been carried through every stage of litigation, and been sustained by the highest courts without objection from that cause, and the law must now be regarded as entirely settled on that subject.

We apprehend, therefore, that the Examiner has not investigated this case with reference to the principles that properly govern it, and we overrule his decision with a view to its re-examination. We express no opinion in reference to any of the claims.

The decision of the Examiner is reversed.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of the reception of their funds.

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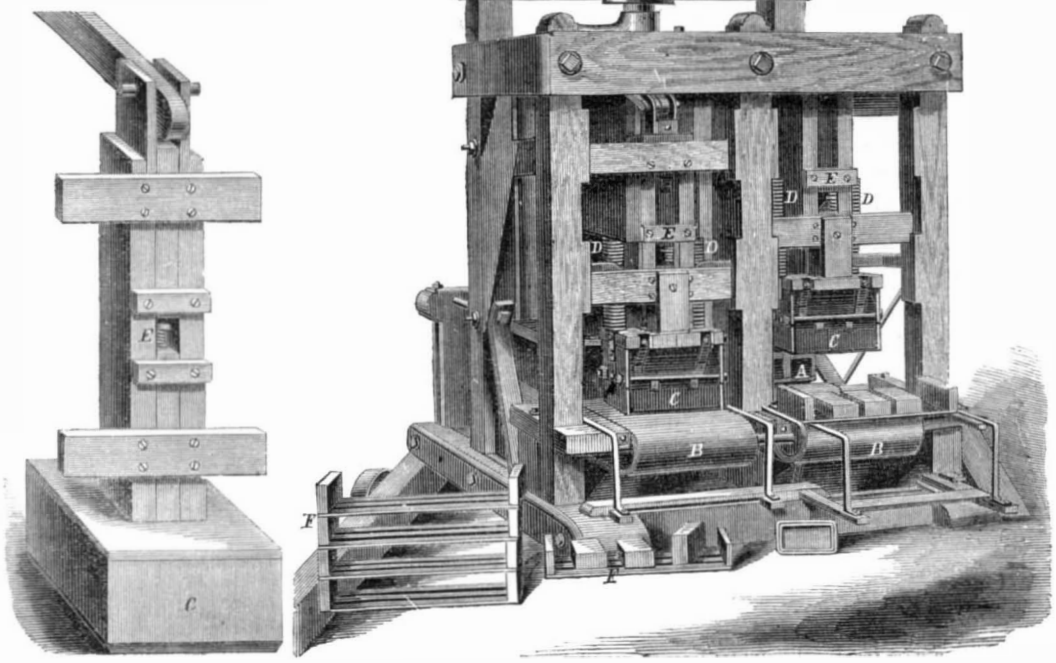
Improved Brick Machine.

This engraving represents a new brick machine of that class where the clay is placed in the pug mill and forced down by the mixing knives to the bottom, and then into the openings, A, in the mud boxes. From the mud boxes, by means of plungers operated by a crank on the main shaft, it is forced through openings in the front of the boxes on an endless band, B, the strips of clay corresponding in size to the bricks. The thickness of the strips of clay is varied by set screws raising or depressing the hinged die plate.

The molds, C, descend as soon as the strips of clay cease to move, and cut through them on to the endless band, underneath which is placed a strong stationary table. The molds are then held firmly down on the table. In case the molds strike a stone or other hard substance, in cutting through the clay, the springs, D, are so arranged that they yield and prevent any part of the machine from being broken. While the molds are held down on the table the followers are forced down and press the bricks. The pressure on the bricks is varied by set screws, E.



CAPRON AND WINCHELL'S BRICK MACHINE.

The molds and bricks are then all raised together, and the bricks are forced out of the molds by the followers on to racks, F, to be removed. The molds are operated up and down by levers connected with an inclined circular track on the main shaft, so that it requires but little power to produce a great pressure on the bricks.

The machine is so constructed that while one set of molds are forming and pressing bricks, the other set are delivering the bricks on racks.

The bricks are pressed sufficiently hard to be handled without marring, so that only racks for one day's work are required.

The machine is also well adapted for making drain tile; the only changes required are to disconnect and remove the molds and place dies of any suitable size in the front of the mud boxes, then arrange a bed of rollers for conveying the tile to be cut into suitable lengths.

The machine is simple in construction, weighing about 2,500 lbs. It is worked by two horses, and will make from 20,000 to 30,000 bricks per day.

Patented July 30, 1866, by E. P. H. Capron and James F. Winchell, Springfield, Ohio. For rights or further information address Capron, Winchell & Co., Springfield, Ohio, or Baker & Short, General Agents, Columbus, Ohio.

Belladonna an Antidote for Opium.

A correspondent, a professional physician, in a letter to the *Medical and Surgical Reporter*, details the circumstances of a case where the patient had taken three ounces of opium tincture, or laudanum, which had exerted its effects three and a half hours. Fluid extract of belladonna was then administered in doses of twenty drops every ten minutes, which, in twenty minutes, arrested the progress of the opiate, and in about eight hours the patient was so far recovered as to sit up and converse. The writer says he is sure that belladonna saved this man's life.

Inflammability of Coal Gas.

Numerous accidents have occurred, especially in the destruction of vessels carrying bituminous coal, from the generation of an explosive and inflammable gas. An English exchange, in noting the fact, recommends thorough ventilation of the cargo as the proper remedy. It is a suggestion worthy of attention. A lantern taken into the hold of a vessel loaded with bituminous coal, which has been kept for days and weeks confined, not unfrequently sets the ship on fire and causes the destruction of life. If a combustible gas, similar to the "fire-damp" of the miner, is generated by the confinement of coal in a ship's hold, the proper remedy is certainly proper ventilation, which can be easily secured by the introduction of pipes, perforated where they pass through the mass, and extending above the deck. If these vertical pipes are connected near the bottom by a horizontal tube, and the forward opening is provided with a funnel like that of a wind-sail, the mouth opening forward in the direction of the vessel's course, and the other pipe having an opening astern, a current would be generated which might safely convey the deleterious gases to the external atmosphere. The subject is worthy more attention than has heretofore been bestowed upon it.

NEWBURY'S SHOE CLEANER.

Every person has experienced the inconvenience of not being able to remove, by the usual means, the dirt and mud adhering in the crevices between

the upper and sole of a boot or shoe. The simple apparatus shown in the engravings is designed to obviate this trouble. It is a clamp of cast iron, A, the two jaws hinged, and the whole secured to the door step or the floor of the entry by screws. A brush or broom of semicircular form is placed between the jaws and secured by the thumb nut and bolt, B. When worn, the brush can be easily replaced by another. No further explanation is necessary, as the contrivance will commend itself to the approval of every housekeeper.

Patented through the Scientific American Patent Agency July 10, 1866, by L. M. Newbury, of Black River Falls, Wis., to whom apply for further particulars.

The Influence of Science.

The address of Gov. Andrew, before the Agricultural Society of Vermont, will well repay perusal, characterized as it is by the depth of investigation and exactness of information which we should be led to anticipate when emanating from such a source. His statements in relation to the agricultural and mechanical interests of our country are worthy the consideration of every one. The statistical information is of great value; figures are stubborn facts which no subtlety of argument can overthrow, their possession furnishes a power which no opponent is able to gainsay or resist, while the acquisition of such power cannot fail to be both pleasant and profitable when presented in the engaging manner of the address before us.

Among the important points brought forward, the following remarks on the value of improvements in machinery seem eminently just: "The activity, the ingenious cunning and the aspiring enterprise of American mechanical inventiveness—have made mankind its debtors, increasing supply, cheapening cost, relieving the hardships of labor, and doing its part toward the amelioration of man's estate. Our own manufacturers introduced the production of heavy cotton fabrics, by the application of the least amount of labor to the greatest quantity of raw material, producing a description of goods cheaper to the consumer than any before existing. They were followed in this, not led, by the manufacturers of England, by whom even the characteristic name of the American article was adopted for their own imitations spun from the cheaper cotton of India. They have assisted in the reduction of the cost of fabrics to the consumer, so that cottons, selling in 1816 for 30 cents the yard, cost but eleven cents in 1846, since which, until the rebellion, they have vibrated with the price of cotton, between seven cents and nine cents the yard.

"One single cause, namely, the application of science to the arts, is seen in the development of manufactures by the highest mechanical agencies. It has brought together the remotest parts of the land; it has restored waste land and bogs, by drainage, by agricultural machinery, and the intelligent adaptation of crops and fertilizers. It is seen in manufacturing and agricultural machinery, in civil engineering, in the construction of bridges, locomotives, cars, steamers, and railways, in the treatment of soils, the management of breeding, the rotation of crops, and the composition of fertilizing materials, and in all the thousand manipulations of practical husbandry.

"I deem it not too much to affirm that the national existence is due this day to our agricultural and mechanical strength as developed by the science of modern times At any previous stage of the world, I see not why an enterprising and obstinate foe, operating on interior lines, and within a territory so vast and so defensible, might not have maintained himself with ultimate success against an invading army three times as numerous as his own. Bringing to our aid the appliances and enginery of modern science and art, these conquered, by overcoming the obstacles of space and time."

AT the late Nottingham meeting, the British *savans* gravely listened to the reading of a paper by a certain Lord, on the raising of weights by the swelling of soaked peas.

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USEFUL IMPROVEMENTS NOT OPPOSED TO THE HARMONY OF NATURE.

That so-called romantic but morbid taste which assumes to itself a peculiar refinement, manifested by sneers at the utilitarian, and talks of desecration when man's ingenuity and needs compel the forces of nature to pay him tribute, is unworthy the thoughtful and judicious mind.

The roaring waterfall, the flowing river, the restless sea, only half subserve the purposes of their creation, when they appeal alone to the eye and exact our admiration or wonder. The useful is intended to be mingled with the beautiful. The two are in absolute and perfect harmony. Whatever in nature appeals to our sense of beauty is useful, at least indirectly, in educating the mind and refining the tastes.

Nature unadorned is not its highest type of beauty. The rocky and barren mountain may excite our wonder, the apparently unbounded plain and the impenetrable forest may arouse our surprise and anxiety but none of them are pleasingly beautiful. We look upon them perhaps as necessary adjuncts to the great plan of nature, but not as contributing directly to human uses. He who has sailed for days and nights over the ocean without meeting a sail, knows the sense of desolation which comes over him as he is forced to believe he is alone. Contrasts highten our enjoyment. A scene of wildness appeals more powerfully to the senses when it is relieved by the sight of a monument of man's ingenuity in a magnificent bridge or centipedal aqueduct. An addition to our enjoyment is afforded when we know that these works assist in the progress of the race. All well-balanced minds look upon every step of progress in mechanical improvement as a means of adding to human happiness, and therefore do not feel a regret because the original wildness of nature is intruded upon by the works of man's ingenuity. Man is the improver of visible nature as well as of the latent forces of natural laws. Nature exists for man. It is for him to study her laws and find the means of executing them. She is the Sphinx whose riddles the inventor will unravel. His improvements are in no wise the antagonists of the beauty and the harmony of nature's laws, uninterfered with by the daring attempts of her latest child. The employment of a waterfall for driving machinery, although it may detract from the original beauty of the fall, does not necessarily disturb the harmony of nature. Utility is not opposed to beauty. Without the mechanical ingenuity of man, the face of nature would be in a measure a waste; for where there is no benefit to man, the purposes of the creator are but half fulfilled.

We prefer to see the raging torrent bridged, the obdurate and impassable mountain tunneled, the valley cultivated, the stream utilized by being compelled to contribute to man's wants, by dams and machinery, and the forest made to yield before his improving footsteps, rather than to view them in all their native wildness and savagery. Man, and not the unaided forces of nature, is the civilizer. The aborigines of this continent held it from time immemorial, but existing as savages, they never improved upon the generation that preceded them. To day, after only two hundred years occupancy, the improving race has multiplied to forty millions, living pleasantly and comfortably, on the soil which gave a meager and miserable support to less than five millions of naked savages, gorged in times of plenty, and who starved and died by thousands in times of scarcity.

He who travels five hundred miles over our railroads, spanning half a continent, and at each mile in his progress sees prosperous villages where but a few years ago was an uninhabited wilderness, who visits prosperous towns or populous cities where but a decennary before was an agricultural hamlet, knows that the improvements of inventors and mechanics add to the beauty of the landscape, as well as contribute to the advancement of the race, and he will not be inclined to believe that the improvements of mechanical and engineering science really infringe upon the domain of the natural.

The truth is, in a nutshell, that the "mission" of this generation, at least, is that of improving—of pushing forward the march of the human race—and it will not do for us to attend to the obsolete and effete ideas of the generations which preceded us, nor to accept the notions of those who would see in the practical Yankee and Anglo-Saxon opinions, an element that would destroy all poetry, romance, and sentiment. For ourselves, we do not despair of seeing the poetry of steam, the romance of steamship voyages, and the sentiment of a sewing machine yet embodied in poetry and story.

THE TOY BUSINESS IN THIS COUNTRY.

The manufacture of toys and "playthings," until within a few years, has been almost wholly confined to Europe. The Germans and Swiss have furnished the rising generation with the most of these necessary adjuncts to the pleasures of childhood. But lately the facilities of the Patent Office have stimulated production in this direction, and now our most amusing toys are those of American manufacture. And it is a profitable direction for inventive genius.

Everybody has seen the comical dancing Ethiopian, cruelly impaled upon a wire, and forced to respond, with every joint in his supple body, to the rattle of the fingers on his pivoted platform. This ridiculous device, being patented, has brought its proprietor a fortune. Then there is the crowing cock, his intestines a tin whistle, able to excite the envy of the monarch of the barnyard by his clear, shrill, and natural challenge. This, also, is a paying investment. The Dervishes and Zouaves, fantastically dressed, suspended by an elastic cord, perform feats of leaping which put to shame the Buislays and Hanlons. On the same principle is the return ball, which, like the Australian boomerang, comes back to the hand that projected it. A top of thin metal, hollow, and gayly lacquered, when started by means of the coiled spring in the handle, will continue its revolutions for ten minutes at a stretch. The flying top is a good illustration of the propeller screw. Released from the shaft on which it is made to revolve, it flies whirling at an angle through the air until its momentum is lost, when back it comes, returning to the operator for a new start. We saw the other day a whistle, a mere gland of kid or thin leather, of a crescent form, holding, stretched between the two horns, a thin membrane, by the vibrations of which, aided by the operator's tongue, a great variety of sounds could be produced. The grunt and squeal of the pig, the warbling of the canary, the whistle of the quail, the piping of the curlew, and many other calls of animated nature, can be perfectly reproduced. This is a useful implement for the sportsman, and affords unlimited delight to incipient manhood.

Almost all these can be used as illustrations of natural laws. Philosophy may yet be taught in our schools by toys. The wonderful resemblance to life of our American toys in many instances, makes a broad distinction between them and those heretofore furnished from Europe. These last are usually caricatures, and are misleading to the young mind, which receives ideas through objects and not through words mainly. Take our rubber toys. Some of them are worthy to rank with the productions of the artist. They are marvels of beauty and natural expression. The dolls made here of this material do not wear that appearance of corpse-like waxiness, or inanity, which the traditional doll from time immemorial has borne. They are pleasing to look at and wonderful in endurance. Some by hidden machinery can walk, others cry and move their eyes, but none are hideous and repulsive in expression.

This toy business may be considered by some as unworthy of notice by scientific journalists; but as we are more or less educated by our surroundings, and as the toys of the child are a prolific source of ideas which will cling to him through life, it is important that they do not convey false impressions. These improvements in our children's playthings are additonal helps toward their education, and while their projectors realize fortunes from their introduction, young humanity and the world at large are pleased and benefited.

THICKNESS OF BOILER PLATES.

In No. 2, current volume of the SCIENTIFIC AMERICAN, we stated, in reply to a correspondent, whose boiler of five feet diameter and sixteen feet long, failed under a pressure of sixty pounds, that the plates of the boiler—five-sixteenths of an inch—were too thin, and quoted Bourne and Fairbairn as our authority, who give three-eighths as the proper thickness for a boiler of those dimensions.

A correspondent writing from Santa Clara county, California, says he has in his mill one of precisely the same size, which he has used for seven years, carrying sixty-five pounds steadily, and that it has never leaked nor strained. It is made of Lowmoor iron, five-sixteenths of an inch thick. Another, which is in his propeller boat, of the same dimensions, made of Pennsylvania iron, five-sixteenths thick, has been running eighteen months, carrying from sixty to seventy pounds of steam, and is certified by the United States Inspector to be able to bear a pressure of ninety pounds. The writer attributes the failure of the boiler mentioned to having too much fire surface and too little steam room, so that not enough of solid or undisturbed water could be kept over the crown sheets to keep them from heating. The steam space being contracted, the suction of the engine probably kept the water in a foam. His boilers, our California correspondent states, have eight-inch water space between the bottom and the lower row of tubes, which are placed in regular rows up and across the boiler, leaving two inches of space between the tubes across the boiler and one inch vertically. Steam drums two feet diameter traverse the whole length of the boiler, connecting with the top at each end with cast-iron pipes. The boilers contain, respectively, one thousand and one thousand and eighty feet of fire surface.

In the case of the defective boiler we think no facts in regard to the steam room were furnished us. It certainly is an important matter that sufficient steam space is given, and that a sufficient depth of water should be maintained over the fire box to preserve the crown sheets from undue heating and consequent weakening. The Lowmoor and Pennsylvania charcoal iron are undoubtedly unrivaled for tenacity, but still we are of the opinion it is better in the manufacture of boilers to err on the safe side. It would be hardly wise to recommend five-sixteenths of an inch as a safe and proper thickness for boilers sixty inches in diameter, however strongly braced, for carrying sixty pounds of steam.

LUCK slips downward to indigence. Labor strides upward and to independence.

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ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING SEPT. 18, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

58,040.—BOLT.—David E. Adams, Alleghany City, Pa.

I claim staving up or enlarging and forming into an oval or elliptic form (when viewed in cross section) that part of the rod of iron intended for the head and square of the neck of bolts, said staving or enlarging into said oval or elliptic form being done previous to the formation of the squaring of the neck and forming of the head of the bolt, which squaring and heading is performed at a subsequent operation.

58,041.—CAR COUPLING. — Homer Atkins, Plymouth, Ill.

I claim the a ustable frame, K, with cross bar, h, and cross rod, g, attached, in combination with the rack bar, I, spring, j, and link, G, all arranged and applied to the draw head, A', to operate substantially as and for the purpose set forth.

58,042.—GLOBE STEAM VALVE.—James O. Attick, Dayton, Ohio.

I claim the arrangement of the shouldered valve stem of the valve, B, with reference to the packing nut, D, nut, C, and valve seat, F, for the double purpose of packing the stem and holding the valve against its seat, in the manner substantially as described.

58,043.—ALARM LOCK.—Seth A. Andrews, Farmer's Valley, Wis.

First, I claim the combination of the sliding barrel, X, the trigger or dog, I, the lug, M, of the barrel, and the spring, P, substantially as described.

Second, I also claim the bolts, Z Z', constructed substantially as described, one being a short bolt, in combination with the claims, J, of the trigger-arm, H, substantially as described.

Third, I also claim forming a magazine, S, in the lock, at one side of the barrel chamber, substantially as described, with a priming orifice, R, in the path of the sliding barrel, substantially as described.

Fourth, I also claim covering the magazine with a cover, J, weakened by grooves or their equivalents, substantially as described.

58,044.—APPARATUS FOR THE MANUFACTURE OF VINEGAR.—Ernest Arleth, Cincinnati, Ohio.

First, I claim the tub, A, having a chamber, C, in combination with tubes, F, and conveying pipe, J, all constructed as above described and for the purpose set forth.

Second, The adjustable cold-air pipe, E, construc ed as above described.

Third, The cold-air pipe, E, in combination with tub, A, as above set forth.

58,045.—COMBINED SEED DRILL AND CULTIVATOR. Aaron Armstrong, Gillespie, Ill.

First, I claim the combination of the roller, D, with the sliding plate, K, and lever, E, as and for the purpose set forth.

Second, I claim the roller, B, in combination with the corn planter, C D K F, the stalk cutter, M, and the seed drill, G I H, when the same are all constructed upon one common frame, A, from which any of the parts except the roller, B, may be removed at pleasure.

58,046.—SPINDLE FOR SPINNING FRAMES.—John E. Atwood, Mansfield, Conn.

First, I claim the inclined tube, D, provided at its upper end with a reservoir, g, in combination with the socket, B, and spindle, a b, when said socket is surrounded by a sleeve carrying the whirr, substantially as herein set forth for the purpose specified.

Second, The bar or rod, E, suspended within the tube, D, and in relation with the annular shoulder, r, formed around the lower end of the spindle, a b, substantially as herein set forth for the purpose specified.

58,047.—CHURN.—John A. Balzart, Piqua, Ohio.

I claim the combination with the suspended dasher of the pivoted arms, F F, forming a collar in the groove of the shaft, D, and the slide, G, for retaining the said collar in position, substantially as described.

58,048.—MACHINE FOR CLEANING GRAIN.—Benjamin Barney, Time, Ill.

I claim the rotary fan, C, hopper, D, shoe, E, provided with the riddle, K, chute, L, and cockle screen, M, and having a longitudinal shake motion communicated to it by the cam or eccentric F, and spring, H, in combination with the suction blast spout, N, all arranged substantially as and for the purpose set forth.

I also claim the valve, O, applied to the spout, N, and provided with the adjustable or sliding weight, g, substantially as and for the purpose specified.

I further claim the extension support, J, formed of the two parts, d d, connected by the screw, e, for the purpose of varying the inclination of the shoe, E, as set forth.

58,049.—CANE STRIPPER.—William N. Barr, Richmond, Ind.

First, I claim the combination of several sets of strippers in one frame, when constructed, arranged, and operating in such manner, substantially as herein described, that one spring acts upon two stripping edges or cutters.

Second, The arrangement of the parallel guide pieces, f' h h', in combination with strippers, B C D E, and springs, F G H, all constructed and operating substantially in the manner set forth.

58,050.—GRAIN SCREEN.—C. F. Baylor, Trenton, N. J.

I claim the combination with the sieves, A B, and chute or conducting board, C, of the conductors, E E, all arranged to operate in the manner and for the purpose herein set forth.

58,051.—PAPER-MAKING MACHINERY.—Edward B. Bingham, Newark, N. J.

I claim the arrangement of two felts and four pressure rolls, as herein described, whereby the web is pressed three times between the two felts, in combination with the arrangement of the doctors, P Q, within the felts, to remove the water from the rolls, D E', as herein set forth.

58,052.—GRAIN SEPARATOR.—John S. Bodge, La Porte, Ind.

First, I claim the construction of covers, E E' E'', of suitable thickness, covering the screens or sieves, B B' B'', with chutes, H, between, corresponding in number with the smooth or imperforated surfaces, C, and opening obliquely or sloping downward nearly or quite their entire length, said chutes being so located that when grains, seeds, or other substances shall pass downward through them, they will fall or be precipitated directly upon the smooth or imperforated surfaces, C.

Second, Constructing and locating the covers, E E' E'', in separate sections, with barriers, F, at their upper angles, and rectangular slips, G G', attached to the ends of said covers to elevate them the requisite height above the screens or sieves, B B' B'', and to keep them the proper distance apart to allow the passage of grains, seeds, or other substances, in such manner that the oblique or sloping chutes, H, through which the grain finds its way upon the smooth or imperforated surfaces, C, above each screen or sieve, will retain their proper proportions and positions relative to the surfaces, C, and above each screen or sieve.

Third, The flaps or aprons, L, composed of flexible, textile, or other fabric, such as rubber, rubber cloth, oil cloth, painted cloth, or any preparation or fabric, so attached to the covers, E E' E'', or to separate pieces to occupy their places, as to adapt themselves to the inequalities of the screens or sieves, B B' B'', and to grains, seeds, or other substances which may be passed between said flaps or aprons and the screens or sieves, in such a manner as to prevent the longer and broader grains, seeds, or other substances from assuming an oblique or perpendicular position while passing over the screens or sieves, thus compelling said longer or broader grains, seeds, or other substances to pass over the screens or sieves flatwise, while the shorter, narrower, and smaller grains, seeds, and other substances are permitted to pass through them when the screens or sieves are in motion.

Fourth, The building or constructing of covers, E E' E'', substantially as herein shown and described, so that they will expand or contract as equally in all parts as possible, and not be liable to warp or twist, thereby preventing the irregularities in their form which would otherwise occur.

Fifth, Securing the flaps or aprons, L, to the covers, E E' E'', by means of the clip plates, A', as shown and described.

58,053.—SKIRT ELEVATOR.—P. J. Boris, Boston, Mass.

I claim the combination and arrangement of the cl sp, B, the tape, C, and the sheath, D, with a lady's skirt, substantially as described.

58,054.—LIQUID FOR CARBURETING AND ENRICHING GASES USED FOR ILLUMINATING AND HEATING.—John F. Boynton, Syracuse, N. Y.

First, I claim the improved liquids for carbureting or enriching gas or air products by combining one or more hydro-carbons, derived from the petroleum, or its equivalent, with one or more hydro-carbons of the coal-tar series.

Second, I also claim carbureting or enriching coal-gas, water-gas, or air, by combining with them the vapor of a liquid, made by combining hydro-carbons of the coal-tar series with those of the petroleum series, substantially as herein described.

Third, I also claim the method or process herein described of manufacturing liquids for carbureting or enriching gas or air, by combining one or more hydro-carbons derived from petroleum, or its equivalent, with one or more hydro-carbons of the coal-tar series.

58,055.—SAFETY APPARATUS FOR GAS MACHINES AND CARBURETORS.—John F. Boynton, Syracuse, N. Y.

I claim a safety device, composed of a body of cooling material, as metal or other good conductor of heat, interposed between the burner and carburetor, and so arranged as to present an extensive surface or series of surfaces to the carbureted air on its passage to the burner, thereby keeping it at a temperature below the point of ignition.

58,056.—T SQUARE.—Austin Bronson, New York City.

First, I claim the bevel stock, D, so constructed and applied to the T square that its sides will project beyond each side of the said square, and thus enable the instrument to be employed for making right or left-hand angular lines without interfering with the head, B, of the square, substantially as herein set forth.

Second, The tangent screw, e, sliding frame, g, and adjusting screw, f, arranged with reference to each other, and with the square, A B, bevel stock, D, and sector, C, substantially as herein set forth for the purpose specified.

58,057.—HOT-AIR FURNACE.—Benjamin Brownell, Chicago, Ill.

I claim the gradually enlarged flues, E, arranged and combined with the dome-shaped casting, G, in a hot-air furnace, substantially as and for the purpose herein set forth.

58,058.—ALARM CLOCK.—J. E. Buerk, Boston, Mass.

First, I claim the arm, l, and segmental disk, i, in combination with the stop lever, e, of the alarm movement, constructed and operating substantially as and for the purpose set forth.

Second, The serrated segment, m, in combination with the tooth of the watch-key, o, and with the alarm movement, constructed and operating substantially as and for the purpose described.

58,059.—CHURN.—William Burson and D. C. Burson, Salineville, Ohio.

First, The dasher, C, when constructed as herein described, in combination with the shaft, B, gear wheels, H and G, crank, J, frame, F, cover, D, and box, A, the said parts being constructed and arranged substantially as and for the purposes set forth.

Second, The combination of the perforated gathering board, M, with the box, A, and dasher, C, substantially as described and for the purpose set forth.

58,060.—PLANTER.—William F. Caldwell, Oxford, Me.

First, The combination and arrangement of the hopper, e, spring, f, pawl, d, ratchet, c, lever and link, m, all constructed, applied, and operating as herein set forth and described.

Second, Connecting the plow and coverer to the carriage body, in the manner described.

58,061.—COOKING STOVE.—James Chambers, Booneboro, Md.

The combination of the parts, D and E, when the latter is constructed and arranged in relation to the former, as shown and described and for the purpose set forth.

58,062.—SAFETY POCKETS.—James F. Chambers, Utica, N. Y.

First, The pocket, A, provided with a spring arm. G, upon its inside, leaving a sharp pointed or needle arm, H, hung to its upper end, when combined together and arranged so as to operate substantially in the manner and for the purpose described.

Second, In combination therewith, the springs, O, upon the inside of the pocket, A, for the purpose specified.

Third, Also in combination therewith, the perforated spring or flexible band, E, secured to the pocket, A, for the purpose described.

58,063.—RECEPTACLE FOR WASTE WATER OF WELL TUBES.—Daniel P. Chesbrough, Lansingburgh, N. Y.

The receptacle, A, having float, I, and valve, G, in connection with the waste water pipe of a well tube, when arranged with regard thereto and connected with the well tube, substantially as and for the purpose described.

58,064. — MANY-BARRELED FIRE-ARMS. — W. J. Christy, Philadelphia, Pa.

First, The application to the trigger, E, of a vibrating arm, d, and lever, d', constructed in such a manner as to effect the release of the hammers in succession, substantially as described.

Second. The application of a guard, G, to the trigger, E, in combination with a contrivance which will lock this guard in front of the trigger when the breech of the barrel is exposed, substantially as described.

Third, In combination with a barrel which has an end play and which is pivoted to the frame of the piece, I claim the spring latch, b, slides k and s, and a trigger guard, G, arranged so as to operate substantially as described.

58,065.—SHEEP RACK.—M. C. Clark, Appleton, Wis.

The combination of the trough, B, feed receptacle, D, and covers, E and F, with each other and with the frame, A, of the rack, when said parts are constructed and arranged substantially as herein described and shown and for the purpose set forth.

58,066.—HANDLE FOR SAD IRON.—Henry Clarkson, Peekskill, N. Y. Antedated Sept. 5, 1866.

The lever, D, with its toe, d, and nose, e', in combination with the stirrup, e, handle, B, flange, b, socket, a, and iron, A, all combined and operating substantially as and for the purpose described.

58,067.—BOOT HEEL.—Frederick Closs, New Haven, Conn.

A revolving heel for boots and shoes, when the same is constructed with a metallic piece, B, and ring, D, said parts being respectively formed, combined with the other portions of the heel and arranged for use as and for the purpose set forth.

58,068.—SAW MILL.—Geo. W. Coddington, Middletown, Ohio.

First, The trestle, D, constructed and arranged as herein described in combination with the carriage, C, and operating substantially as and for the purpose set forth.

Second, The combination of the spring, F, catch, G, chain, H, and trestle, D, with the carriage, C, substantially as described and for the purpose set forth.

58,069.—CAPSTAN WINDLASS.—Z. E. Coffin, Newton, Mass.

First, I claim the employment of the capstan, a, and its system of gears, j k l, in combination with gears, r s, and the windlass barrels, t u, substantially in the manner and for the purpose set forth.

Second, I claim the arrangement of the barrels, t u x x, and the gear, S, to turn upon the shaft, V, this shaft being a fixed one and not allowed to rotate, substantially as described.

Third, I claim the two or more rollers, y, in combination with and to support the windlass barrels and shaft, t u and V, substantially as described.

58,070.—SAD IRON.—Elisha T. Colburn, Boston, Mass.

I claim the heat reflecting guard, C, made substantially as described so as to be applied to the sad iron in manner and for the purpose specified, such guard being composed of the plates, a a, the standards, b b, and the legs, c c, and having the notches, d d, formed in the parts, a a, as explained.

57,071.—WAGON SHACKLE.—Lucius M. B. Coleman, Danby, N. Y.

First, I claim the use of washers or metallic cylinders in the ears of a wagon shackle, and transfer as far as possible the wear in the shackle joint to the surfaces made by the periphery of the same and the said ears, when virtually made as described.

Second, I claim the described beveling of the washers and of the corresponding holes in the ears of the shackle for the purpose of tightening the shackle from time to time as described.

Third, I claim the combination of the described device or devices, for preventing motion about the iron bolt, but allowing the same about the washers or cylinders, and of the washers or cylinders in the eyes of the e rs of the shackle with the wearing surfaces in the said ears, the same making a whole as described

58,072.—TOBACCO PIPE.—Malcolm M. Coppuck, Philadelphia, Pa.

I claim a tobacco pipe consisting of the open bottomed fire and tobacco chamber, A, neck piece, d, exhaust chamber, B, and stem, C, the same being arranged and combined together as and for the purposes described and set forth.

58,073.—HORSE RAKE.—Nicholas C. Decker, St. Louis, Mo.

First, I claim the construction and arrangement of the rock shaft, c, and its springs, c3 and c4, its levers, c1, and the bar c2, as described and set forth.

Second, I claim the arrangement of the segmental grooves, b, in the post, B, for the purpose of rendering easy the revolution of the rake.

58,074.—VALVE GEAR FOR STEAM ENGINE.—William Dennison, Washington, D. C.

First, I claim the cam, H, arranged to operate in such a way as to cause the valves of steam cylinders to move continuously, while the piston of the steam cylinder be in motion by a stud or pin on the piston rod or other attachment producing the same result, substantially as set forth.

Second, A steam cylinder having its openings and valves arranged on a line with the axes of the cylinder, substantially in the manner set forth.

Third, I claim the cam, H, the rock shaft, F, and the steam cylinder with its steam valves, E E', combined and operating as and for the purpose set forth.

58,075.—HORSE RAKE.—Joseph Dillier, Greensburg, Ind.

I claim a horse rake having the teeth, E, attached to a hinged beam, F, retained when down by a hook, G, and disengaged and raised by a lever, I, the said several parts being respectively constructed and combined for use by intermediate mechanism arranged substantially as set forth.

58,076.—MACHINERY FOR CUTTING KEY SEATS.—John K. Dirner, Honesdale, Pa.

I claim the spindle, X, in combination with the plate, P, pivoted to the flanges, O, and adjusted by set screws, R R, constructed and arranged substantially as described for the purpose specified.

58,077.—TWEER.—Levi A. Dole, Salem, Ohio.

I claim a tweer which is composed of blast pipe, A, and a chambered portion, B, cast in one piece, substantially as described.

58,078. — ICE BREAKER. — Charles. W. Dunlap, Brooklyn, N. Y. Antedated Sept. 5, 1866.

I claim the ice breaker formed with a metal band around the larger portion of the wooden handle of the ice pick, as and for the purposes specified.

58,079.—RIFLE BOX.—Rhesa H. Dunning, North San Juan, Cal.

I claim the rifle box, C, damwall, D, or their equivalents, to be employed for saving gold at any point where there is a divide of waters, substantially as described.

58,080.—STRAW CUTTER.—J. Eiberweiser and R. Weber, Cincinnati, Ohio.

We claim the arrangement of a knife, H, suspended by two arms, F F', pressure board, I, bent lever, T T', feeding mechanism, C D E V W X, and cam, S and U, for the purposes explained.

58,081.—PROTECTING ANIMALS FROM THE HEAT OF THE SUN.—Charles Elveena, New York City.

I claim the method herein specified of protecting animals from the heat of the sun by a shield, constructed substantially in the manner specified.

58,082.—CULTIVATOR.—Samuel P. Etter, Scotland, Pa.

First, I claim the compound levers, R and Q, connected to the plow beams by the braces or rods, V V, when constructed and operated for the purposes and substantially as described.

Second, I claim the compound levers, R and Q, rods, V V, and plow beams, H H, in combination with the pendants, G G, and pendent guides, J J, substantially as and for the purposes shown and described.

58,083.—HAND PROPELLER FOR SMALL BOATS.—John Fehrenbatch, Ind.

I claim the combination of the bevel wheels, 3 and 8, the ratchets, 2 and 11, the dogs, 4 and 10, and springs, 5 and 9, with the upright shaft, 1, and lever, 17, and with the pinion, 7, on the shaft, 13, which propels the screw, all applied for the purpose of propelling small boats.

58,084.—SKATE.—M. Fleisher, Philadelphia, Pa.

First, I claim the notched foot rest, C, for holding the end of the lever, K, combined with the clamps, J G, of the heel rest, B, substantially in the manner, and for the purpose represented and described.

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Second, The combination and arrangement of the clamps, O, bar, Q, straps, R, notched rest, C, lever, K, clamp, G, heel rest, D, constructed and operating in the manner and for the purpose herein represented and described.

58,085.—PUMP.—A. F. Fletcher, Athol, Mass.

First, I claim a pump box constructed in two or more parts so arranged and combined as to secure the parts to each other and the packing of leather or other suitable material to the pump box, in the manner substantially as and for the purposes described.

58,086. — ROTARY STEAM ENGINE. — Matthew Fletcher, Louisville, Ky.

First, I claim the method of reducing the side strain on the rotative shaft through the connection of cylinder with eccentric ring flyers, flyers ends and half rounds, c c c c c c, in drum, m, substantially as described.

Second, I also claim the arrangement and combination of the brushes, P P, and small metal packer rings, f f, by which means soft or elastic packing is avoided from pressing on the revolving shaft.

58,087.—APPARATUS FOR GENERATING AND BURNING VAPOR OF HYDROCARBON OILS.—Henry R. Foote, Oil City, Pa.

I claim, First, The combined retort and gas holder, constructed substantially as described.

Second, I claim the coil of metallic tubing charged with iron filings, or their equivalents, and the heaters connected with the gas holder for the purpose of generating hydrogen gas by the decomposition of steam, substantially as and for the purpose set forth.

Third, I claim the tubes at the bottom of the retort with supply pipes elongated so as to extend into the gas holder, as described.

Fourth, I claim the arrangement of burners connected with the gas holder, substantially as described.

Fifth, I claim the hood attached to the bottom of the retort, for the purpose of protecting the lower burners, as described.

58,088.—AMALGAMATING GOLD WITH MERCURY.—M. Foreman and J. R. Mathewson, Philadelphia, Pa.

First, We claim the amalgamation of gold with mercury by circulating pulverized ore, combined with water, upward through a body of mercury, substantially in the manner described.

Second, We also claim heating the mass of auriferous ore and water by a jet of steam, which induces the above-mentioned circulation, substantially as specified.

58,089.—ORE QUARTZ CRUSHER.—Joseph Fowler, Rahway, N. J.

First, I claim the yielding eccentric bearing shaft, f or f', and weighted lever, g or g', applied in substantially the manner specified, to keep the jaws at their lower ends toward each other, but allow them to open or yield, as and for the purposes set forth.

Second, I claim the combination of the jaws, d and k, connecting rods, l l, and cranks, 1 and 2 2, when the jaw, d, is connected directly to the crank, 1, and receives the movement specified, for the purposes set forth,

Third, I claim the links, e, in combination with the eccentric yielding bearing, f, and moving jaw, d, as and for the purposes set forth.

58,090.—CAR COUPLING.—Robert G. Fowler, Olney, Ill.

I claim the jointed coupling bars, G G, having springs, I, and wedge-shaped heads, g g, which slip upon and catch behind each other, permitting the automatic uncoupling by lateral or vertical deflection of one car relatively to the other, under the circumstances described.

58,091.—CLASP FOR MAIL BAGS.—Leander Fox, New York City.

I claim the adjustable metal clasp, B, with permanent raised letters, operating on a joint, C, and swivel, D, as herein described and for the purposes set forth.

58,092. — APPARATUS FOR INSERTING FUSIBLE PLUGS IN STEAM GENERATORS.—Joseph French, Pittsburgh, Pa.

I claim the combination of the ring, c, for holding the fusible plug in the flue, the tubular rod, e, and screw, f, for closing the bore of the rod, e, constructed and arranged substantially as and for the purposes hereinbefore described.

58,093.—WATER ELEVATOR.—James Freret, New Orleans, La.

I claim the combination of the double or compound valves, C' D', and C'' D'', with the cisterns, G and F, and simple valve, C, when these several parts are constructed and conjointly operate, substantially as described for the purpose set forth.

58,094.—BRIDGE.—John H. Gilbert, Roxbury, Mass.

I claim the combination of the angle plates, D, pierced side plates, C, floor beams, E, flanged arched plates, B, constructed and operating substantially as described for the purpose specified.

58,095.—APPARATUS FOR SEPARATING GUM FROM CANE JUICE. — Henry Gortner, Deavertown, Ohio.

I claim an improved apparatus for separating the gummy substance from cane juice, formed by the combination of the disks, B, and pipes, b', with the partitions, a', of the apparatus, the various parts being constructed and arranged substantially as herein described and for the purposes set forth.

58,096.—BOLT-HEADING MACHINE.—Chas. Hall and Emil Hubner, New York City.

First, We claim the combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, carriage, preparing dies and set of finishing dies, consisting of an upsetting die and side dies, substantially as set forth.

Second, The combination in a bolt-blank machine of the following instrumentalities, viz.; the upsetting die, side heading dies, turning tubular die, and cam tappets which operate the side heading dies twice for each operation of the upsetting die, substantially as set forth.

Third, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, turning tubular die, and carriage, substantially as set forth.

Fourth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, upsetting die, gage and cam, substantially as set forth.

Fifth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, side dies, gage and cam, substantially as set forth.

Sixth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the tubular die, upsetting die, side dies, gage and cam, substantially as set forth.

Seventh, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, tubular die, gage and cam, and carriage, substantially as set forth.

Eighth, The combination in a bolt-blank machine of the following instrumentalities, viz.; the heading die or dies, turning tubular die, gage and cam, substantially as set forth.

58,097.—LAMP BURNER. — Thomas Hall, Bergen, N. J.

I claim the connections, A and B, and stop, C, substantially as described for the purposes set forth.

58,098. — GRANULATING AND DRYING SUGAR. — Jesse Hanford, Lexington, Mass.

I claim the combination of the rotary hollow drum or cylinder, I, and the tubular heater, arranged and connected substantially as described.

I also claim the combination of the rotary or hollow cylinder, I, the crushing roller, K, and the tubular heater, arranged and applied together substantially in manner and so as to operate as and for the purpose described.

I also claim the combination of the journals, c c, and their supporting standards, B B, of the tubular heater with such heater and the rotary cylinder, or the same and the crushing roller, applied and arranged together, substantially as specified.

I also claim the combination and arrangement of the series of helical wings, 11, with the cylinder and the heater, applied in manner and so as to operate as specified.

58,099.—FEED-WATER HEATER.—Geo. Hasecoster and J. Stephens, Richmond, Ind.

We claim the combination of the rod, B, flanged shelf, C, flanged perforated plates, D E F, constructed and arranged as described; the receiving cup, f, and washers, I, with the cylinder A, substantially in the manner and for the purpose herein specified.

58,100.—DESULPHURIZING ORE. — John A. Hitchings, Denver City, Colorado.

First, I claim the arrangement of the crucible with its domecovering sectional lid and discharge openings, M P, substantially as and for the purpose described.

Second, I claim the combination with the crucible of the water supply tank, K, as and for the purpose described.

58,101.—SPINNING MACHINE.—Charles B. Hoard, Watertown, N. Y.

First, A removable tube or spindle for twisting roving while being drawn, when the twist is imparted from one side of the tube or spindle and the roving is conveyed to the bite of the draw rollers from the center of the tube or spindle, substantially in the manner described.

Second, The combination of a removable twisting tube or spindle, constructed substantially as described, with a revolving tube driven by a whirl, substantially in the manner set forth.

Third, The combination of a removable tube or spindle with the whirl tube and drawing rollers, when constructed, arranged, and operating substantially in the manner and for the purpose set forth.

58,102.—PENCIL HOLDER.—Henry W. Holly, Norwich, Ct.

The holding stem or tube, A, provided with a single slit, c, formed longitudinally in one side thereof, in combination with the sliding ring or collar, C, substantially as herein set forth for the purpose specified.

58,103.—HOISTING APPARATUS.—George L. Howland, Topsham, Me.

I claim an improved hoisting apparatus formed by combining with each other the bars, A B, the levers, D H, the pawls, C I, the spring, K, and the stop, L, the parts being constructed and arranged substantially as described and for the purpose set forth.

58,104.—MACHINE FOR MAKING NUTS.—W. W. Hubbard, Philadelphia, Pa.

First, I claim the revolving disk, J, with its recesses, Z, in combination with a series of punches and dies arranged in a circle, the whole being constructed and operating substantially as and for the purpose described.

Second, The cross head, E, and its arm, L, in combination with the shaft, H, and its rib, w, the whole being constructed and operating substantially as and for the purpose specified.

Third, The combination of the boxes or casings, c, punches, d, and gibs and keys, the whole being arranged substantially as and for the purpose set forth,

Fourth, The carriers, M and M', with their adjustable hammers, the whole being arranged in conjunction with the rotating disk, J, to operate on the blank, substantially as and for the purpose described.

Fifth, The combination of the carriers, M M', lever, T, and arms and levers, p q, the whole being arranged and operating substantially as and for the purpose set forth.

Sixth, The slide, 7, and spring, 5, or its equivalent, in combination with the cutters, d k.

Seventh, The slide, m, operating in combination with the punch, d3, hammers, S S, and disk, J, substantially as and for the purpose described.

58,105.—MAGNETO-ELECTRIC APPARATUS.—Jerome Kidder, New York City.

First, I claim the construction and arrangement of an electromagnetic apparatus, whereby the primary current through two helices or systems of helices is thrown successively in opposite directions, or so as to develop induced currents successively in opposite directions, substantially as herein described.

Second, The arrangement of the parts of an electro-magnetic apparatus, whereby the currents from two helices or systems of helices are made to flow in succession, one immediately after the other, in a uniform direction, substantially as herein set forth, such currents being either of the same character, made thus more rapid in succession, or of different degrees of tension or concentrative or diffusive influence.

Third, I claim for adjusting the screw opposed to the vibrating spring of an electro-magnetic apparatus the use of the arrangement as represented by v y, operating substantially in the manner described.

58,106.—MEDICINE.—N. Kieffer, New Orleans, La.

I claim the medical compound composed of the ingredients herein named and mixed together, in or about the proportions named.

58,107.—OILER.—Parley Lafiin, Warren, Mass.

I claim the bifurcated guide, F, in combination with the tube of an oiler, substantially as and for the purpose set forth.

58,108.—RACK FOR HAULING WOOD.—Abraham Landis, Colesburg, Iowa.

I claim the woodrack herein described, the same consisting of the sills, A, sleepers, B, and stakes, C, all secured together by the loops or stirrups, D, in the manner and for the purpose explained.

58,109.—ANTI-FRICTION JOURNAL BOX.—Henry M. Le Duc, Washington, D. C.

I claim the rims or projections, G F, within the hub or box, and around the axle respectively, extending into annular grooves in the concentric series of larger rollers to maintain them in position longitudinally, substantially as described.

58,110.—HORSE HAY FORK.—Thomas Lloyd, Muncy, Pa.

I claim the employment, in combination with the main bar, A, of pivoted fingers, D D', and arms, E E', operated by means of a vertical rod, C, and lever, B, the whole arranged substantially as set forth.

58,111.—APPARATUS FOR UPSETTING TIRES.—Levi W. Loomis, Homer, N. Y.

I claim the movable plate, B, provided with the notched strip, C, and operated by a shoulder of the lever, D, and arms, Z Z, to force said plate against the body, A, to upset the tire when held between cams and ratchets, substantially as herein set forth.

58,112.—SHOVEL PLOWS.—William H. Luce, Hampton, Ill.

I claim the general construction and form of the beams, A, and handles, C C, in combination with a double concave mold board, B, substantially as described.

58,113.—APPARATUS FOR DISTILLING PETROLEUM, ETC.—Orazio Lugo, New York City.

First, I claim the admission of air or gas into the goose-neck or exit pipe of the still, substantially as and for the purpose herein specified.

Second, Varying the point of admission of the air or gas, B, into the still and goose-neck or exit pipe as the process of distillation progresses, substantially as and for the purpose herein set forth.

58,114.—SPIRIT METER.—Wm. Magrowitz, New York City.

First, I claim the arrangement and construction of the wheel, A, provided with chambers or cavities, in combination with the roller, E, and float, G, operating in the manner substantially as described.

Second, I claim the arrangement of the levers, D, with the roller, E, in combination with the lever, F, and float, G, and operated by set screws, C and D, in the manner and for the purpose set forth.

Third, I claim the arrangement of the paper rollers, P P', and the manner of operating the roller, P, by means of the friction roller, O, for the purpose substantially as set forth.

Fourth, I claim the manner of operating the friction roller, O, from the shaft of the wheel, A, by means of the gearing, 2 and 3, flanch wheel, 4, pin, 8, and pawl lever, R, when arranged and combined in the manner and for the purpose specified.

Fifth, I claim the box, K, in combination with the pipe, g, and cylinder, I, the hydrometer, M, with the needle, N, at its upper end, for the purpose substantially as set forth.

Sixth, I claim the frame, S, in combination with the needle, N and the manner of operating said frame, S, and needle N, substantially as and for the purpose described.

Seventh, I claim, in combination with the hydrometer, M, and its needle, N, the endless paper wound on roller, P' and P, and lined in the manner described, and operating together substantially for the purpose specified.

Eighth, I claim the friction pulley, k, with its lever, K, in combination with the measuring wheel, A, for the purpose set forth.

Ninth, I claim the combination of the measuring wheel, A, with its registering device, the hydrometer, M, provided with a marking needle, N, the paper rollers, P and P', with paper lined in the manner described, the friction rollers, O and O', and the frame, S, when arranged and operating together so as to mark the quantity and the weight or specific gravity of alcohol or other liquid which is made to pass through the box, V, or through the machine, substantially in the manner as set forth and specified.

58,115.—CAR BRAKE.—Samuel McCambridge and Edward G. Martin, Philadelphia, Pa.

We claim the combination of a series of coil springs with a train of cars and the continuous chain, which operates the brake levers, by means of the cylinders, B, shafts, C, and chains, F, the several parts being arranged and operating substantially in the manner described and for the purpose specified.

58,116.—ORE OR QUARTZ CRUSHER.—E. P. McCarthy, San Francisco, Cal.

I claim the use of a rubber tappet, A, steel shod, the steel shoe, B, plate, E, and bolts, F F, combined in the manner and for the purposes set forth.

58,117.—DEVICE FOR HOLDING ROLLED WORK WHILE BEING STITCHED.—Wm. M. McCoy, Bloomingdale, Ind.

I claim a device for holding rolled work while being stitched, constructed and operating substantially as specified, that is to say: I claim the bed piece, A, having a groove, a, along its upper face, and provided with a tightening band, B, operated by a set screw, C, substantially as shown and described.

58,118.—BLOW PIPE.—Josiah McFarland, Clinton, Ill.

I claim in blow pipes, a detachable air chamber, A, in combination with the flexible tube having a suitable mouthpiece for directing the current of air or gas, and a force pump, all constructed and operated substantially as described.

58,119. — PLOW. — F. W. McMeekin, Morrison's Mills, Florida.

I claim the standard, C, constructed of a single metal bar, doubled and bent so as to have two diverging arms, a a', and an inclined loop, b, in combination with the land side and mold board, all arranged to form a new and improved plow, as set forth.

58,120. — SAFETY ATTACHMENT FOR POCKETS.—John Metzendorf, New York City.

I claim a watch pocket protector, composed of two jaws, A and B, flexibly connected together at one end, and furnished with a catch at the other end, and provided with eyelets or other means of attaching it to the pocket, all substantially as herein described.

58,121.—SADDLE.—Jacques Meyer, Williamsburgh, N. Y.

I claim the device formed of the case or thimble, c, inclosing the spiral spring around the pin, d, for the purpose of attaching and detaching stirrup straps to a saddle, constructed and applied in the manner herein described.

58,122.—LANTERN.—F. Meyrose, St. Louis, Mo.

First, I claim inclosing the wick elevating rod or shaft, a3, with a tubing or casing, a2, for the purpose of conducting any moisture or fluid that may escape on the said rod outside of the guard of the lamp or lantern.

Second, I claim the cap, F, either with or without the ventilators, substantially as described.

58,123.—EDGE PLANE.—S. Miller, Urbana, Ohio.

I claim the exposing of the cutting edge of bit, B, always evenly and securely at one operation, as described, or any other way substantially the same.

58,124.—SNOW PLOW.—Robert B. Nevens, Lowell, Mass.

I claim, First, The combination and arrangement of the fence, A, and facing, d, sides, B B, levelling beam, C, and mold boards, E E, substantially as and for the purpose set forth.

Second, And in combination with a snow plow constructed and arranged as above stated, I claim the employment of the auxiliary brace chains, F and H, connected with the entire draught chain, G, substantially in the manner and for the purpose specified.

58,125.—CORN CULTIVATOR.—D. I. Noble, New Boston, Ill.

I claim the adjustable foot-pieces, L L, connected to the plow standards, I I, and arranged with brace, K, in combination with the mode of attaching said standards to the frames, C and F, substantially as and for the purpose herein specified.

58,126.—MACHINE FOR POUNCING HATS.—Emile Nougaret, Newark, N. J.

First, I claim the swivel disk, B, carrying the block, D, in combination with the adjustable disk, F, carrying the pouncing rollers k k, constructed and operating substantially as and for the purpose described.

Second, The gears, l m, and revolving shaft, F, in combination with the pouncing rollers, k k, and block, D, constructed and operating substantially as and for the purpose set forth.

Third, The brake, p, in combination with the disk, F, spring, n, pouncing rollers, k k, and block, D, all constructed and operating substantially as and for the purpose described.

Fourth, The rollers, G G, and supporting brackets, t, constructed and operating substantially as and for the purpose set forth.

58,127.—LOCOMOTIVE.—John C. Parker, Chicago, Illinois.

First, I claim providing the nozzles of the exhaust pipes of a locomotive engine with valves which shall be allowed to close by a movement of the reversing lever, substantially as described.

Second, The combination of the draw rod, D, and valves, d d, with the spring, f, and a contrivance which will effect the tripping of said rod when the engine is reversed, substantially as described.

58,128.—ANCHOR.—G. C. Pattison, Baltimore, Md.

I claim providing the flukes of an anchor having pivoted arms with stationary guards, substantially as and for the purpose herein described.

58,129.—STRAW CUTTER.—S. Pettibone, Corunna, Mich.

First, I claim the application of the fly-wheel, B, in combination with crank wheel, C, pitman, D, and lever, E, substantially as and for the purposes described.

Second, The adjustable box, or bearing, F, in combination with the lever, E, gage, G, and throat, I, for the purposes and substantially as herein shown and described.

Third, The mode of securing the gage plate, G, to the lever, E, as and for the purposes and substantially as herein set forth.

Fourth, The mode of securing the lever, E, to the pivot, by means of mortise and key, substantially as herein shown and described.

58,130.—FASTENING FOR GATE.—Pompeius Philippi, Beardstown, Ill.

I claim the arrangement of the hooked rod, J, and lever, K, in combination with the bar, B, posts, E F, and pin, D, constructed and operating in the manner and for the purpose herein specified.

58,131.—SHIRT BOSOM.—C. F. Pidgin, Boston, Mass.

I claim a shirt bosom, cut or hollowed out at its sides, B, and end, C D, in combination with the straps, F, substantially as and for the purpose described.

58,132.—ASH SIFTER.—Charles L. Pierce, Buffalo, N. Y.

I claim the inclosing case, A, and removable charger, D, the said case being fitted to receive and support the charger, and the

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charger having a hinged bottom so that its contents may be discharged into the sieve, the inclined open-end sieve, B, the operating gearing, and the ashes box E, combined as herein described.

58,133.—Dental Mallets.—Chandler Poor, Dubuque, Iowa.

I claim the sliding mallet, i, piston, a, spring, f, and socket, b, by means of which to apply force to a common plugger or point in filling teeth. My claim has no reference to said plugger or point except in the manner of applying force to the same.

58,134.—Machine for Making Screws.—Treat T. Prosser (assignor to himself, G. W. Gillet, J. A. Eastman, D. Rimbark, J. R. and D. H. Wells), Chicago, Ill.

I claim the method of forming the threads on screws by means of revolving swages or dies, constructed and operated substantially as and for the purpose set forth.

Second, I claim the grooved rollers, a, when arranged and operating as described, for the purpose of forming threads on screws.

Third, The combination of the revolving swages or dies, a a, with the anvil or rest, u, substantially as set forth.

Fourth, The chuck, E, constructed and operating as herein described.

Fifth, The combination of the hollow shaft, F, chuck, E, and rack shaft, d, provided with the arms, f and c, when arranged to operate as and for the purposes set forth.

Sixth, In combination with the shaft, F, and hopper, H, I claim the follower, I, arranged to operate as described, for the purpose of feeding the blanks into the shaft, F, as set forth.

58,135.—Corn Planter.—A. Putnam, Owego, N. Y.

First, I claim the drill tooth, G, wheel, F, and adjustable slide bar, E, arranged and operating as described.

Second, In combination with the above I claim the arrangement of the cams, D, bar, A, spring, K, and valve, g, as and for the purpose specified.

58,136.—Car Brake.—J. Wyatt Reid, New York City.

First, I claim the combination of chains, rods and pulleys, for operating the brakes, the whole substantially as described.

Second, The combination with the car brakes of the guards, r r, constructed and applied in the manner and for the purpose set forth.

58,137.—Machinery for Making Nails.—Samuel G. Reynolds, Bristol, R. I.

First, I claim giving lateral support to that portion of the nail blank which is to be upset to form the head, during the operation of heading the nail, by means of the radial supporting bar, A, arranged to co-operate with the header, H, substantially as herein described, for the purposes specified.

Second, Combining and arranging the gripping die in a nail-making machine with the movable cutting shear, as described, so that the former shall change its position relatively to the latter, for the purpose of lowering the blank during the swaging and heading operation below the cutting edge of the shear, in the manner and by the means substantially as herein set forth.

58,138.—Flat Iron.—E. B. Robinson, Portland, Maine.

I claim the combination and described arrangement on a flat iron of the glass or porcelain handle, H, and the hinged guard and reflector, D, as and for the purposes herein set forth

58,139.—Surcingle.—D. P. Rood, Warsaw, N. Y.

I claim an elastic, B, made of rubber or other suitable material, in combination with the webbing, A, so as to cause the surcingle to adjust itself to the varying size of the horse, for the purposes and substantially as herein described.

58,140.—Machine for Harvesting Beans.—D. C. Rosier, Clarkson, N. Y.

I claim the arrangement of the L-shaped cutters, C, in combination with the elevating or adjusting devices, in the manner and for the purposes set forth.

58,141.—Trunk.—Alfred V. Ryder, New York City.

I claim a trunk provided with a hinged portion, A, formed by the vertical and horizontal cuts, a b, in the main portion and hinged to the part, B, so that it may when turned up or opened, rest upon B, the parts A B being provided with drawers, and the other parts, D, provided with a lid or cover, substantially as shown and described.

I further claim, in combination with the hinged portion, A, the metal stays or plate, E, applied to the ends of the trunk and having the handles, F, attached, substantially as set forth.

58,142.—Hook for Davit-fall Block.—William R. Satterly, Port Jefferson, N. Y.

I claim the combination, with the davit-fall block, of the hook, D, link, H, and cord, I, operating substantially as described.

58,143.—Corn Harvester.—Samuel Secrist, West Liberty, Ohio.

I claim, First, The reels, j j, with their arms engaging with each other, in combination with the box, G, substantially as described for the purpose specified.

Second, I claim the reels, k k, in front of the sides, G G, for gathering up the leaning and broken stalks, and passing them on to the cutters, constructed substantially as herein described.

Third, The arrangement of the revolving platform, H, hoop, o, discharging gate, half-hoop, r, spiral spring, t, constructed and operating substantially as and for the purpose specified.

Fourth, The lever, b, and the clamp, g, suspended by the standard, J, over the platform, H, to gather the shock together at the top and set it off, standing upright on the ground, constructed substantially as herein described.

58,144.—Washing Machine.—Henry Sidle, Minneapolis, Minn.

I claim the box, A, with its vertical rollers, B B, arranged with the top, C, and shaft, D, with its oblique arms, F F, substantially in the manner and for the purpose herein specified.

58,145.—Tweer.—Thomas Sinnott, Brooklyn, N. Y., and James McIntyre, New York City.

We claim, First, A series of wings, or divisions, around the blast pipe, with openings at alternate opposite ends to cause the air or blast to travel back and forth within the tweer, for the purposes and as set forth.

Second, We claim the valve, l, attached to the block, m, in combination with the blast pipe, a, for the purposes set forth.

Third, We claim the movable nozzle, n, in combination with the tweer, as and for the purpose specified.

58,146.—Brick Kiln.—Francis H. Smith, Baltimore, Md.

I claim the middle flue, A, beneath the floor, extending outside the walls to connect with furnace, F, and having lateral communications with ash pits.

I claim the furnace placed at the mouths of said flue, heating all the air that passes into the kiln, creating the hot blast.

I claim the middle door, e, in combination with the flues, A and C, and the furnace, F.

58,147.—Cultivator.—Andrew Stark, Topeka, Kansas.

I claim the pivoted bars, L L, having the driver's seat, N, attached to them, in combination with the plow beams, H H, connected at their front ends to the front part of the frame of the machine, and the plow beams and bars connected by chains, h, or their equivalents, substantially as and for the purpose specified.

58,148.—Roofing Cement.—Jesse Stow, Geneva, Ohio, and James White, Cleveland, Ohio.

We claim a plastic roofing cement composed of the ingredients herein named and compounded, as specified.

58,149.—Amalgamator.—Stephen G. Sturges, Newark, N. J.

I claim the flute or pocket, t, when attached to a reciprocating or revolving cylinder, in the manner and for the purpose substantially as shown,

Also, the bolts, w, extending across as supports to the cylinder, when used in combination with the pocket attached to the cylinder.

58,150.—Deep Well Pump.—J. W. Summers, Tarr Farm, Pa.

First, I claim suspending the piston of a pump from the pump rod by means of a ball and socket joint, substantially as described.

Second, I also claim the cylindrical stop, G, having its upper edge leveled as shown, for the purpose of catching rivets and other objects, and directing them into the piston, substantially as described.

58,151.—Saw-filing Machine.—Alvah Sweetland, Syracuse, N. Y.

I claim the swing bar, the adjustable table, the rag, the dog, the lever, the rag wheel, the straight file, the cylinder, the clasps, and the connecting rod, the whole being arranged and combined substantially as as and for the purpose set forth.

58,152.—Chuck.—Royal H. Thorn, Syracuse, N. Y.

I claim clamping the jaws, C C', by the screw, D, and allowing the same to play freely through the body of the chuck, for the purposes set forth.

58,153.—Bottle Stopper.—Samuel H. Timmons, Lafayette, Ind.

I claim, First, A cup, graduated or otherwise, fitting a base piece to be attached to the cork or neck of a bottle of any size.

Second, The base piece, provided with an entering shank, for insertion into a cork, and with a flange for the reception of the cup, substantially as described.

Third, I claim a graduated cup attached to the stopper or neck of a bottle, for the purpose described.

58,154.—Artists' Stretcher.—Joel E. Todd, Middletown, Conn.

Making the angle of artists' stretchers self-adjusting by means of springs, F, or equivalents therefor, substantially as herein described.

58,155.—Machinery for Making Railroad Chairs.—William Van Anden, Poughkeepsie, N. Y.

I claim, First, The dies, G G, arranged to take hold of the metal plate at its edges, and constructed and operating so as to form the lip flanges and a projecting base on said plate, all substantially in the manner and on the principle herein set forth.

Second, The devices, c' c', in combination with a plunger, for curving or slightly bending the plate of metal, the same being arranged and operating substantially as described.

Third, Forming on a metal plate, which has been previously curved or bent, and from which a rail chair is to be made, a projecting base, and flanges standing at right angles, or nearly so, with the base of the plates, ready for the action of the finishing dies, by means of swaging dies, G G, in combination with an anvil, a, and a former, e, substantially as described.

Fourth, The combination with the anvil, a, and dies, G G, of the elevated pieces, a3 a3, so as to form a box die conforming to the shape of the base of a chair blank, substantially as and for the purpose described.

Fifth, The combination of the plunger or former, e, swaging dies, G G, and finishing dies, J J, working in a manner and for the purpose of forming a metal chair having a continuous lip, substantially as described.

Sixth, Making from a plate of metal, by one machine, and by a succession of operations in the said machine, a chair, substantially as represented in fig. 8, the means for doing this being constructed and operating substantially in the manner and on the principle herein set forth.

Seventh, Discharging a chair by means of the discharger, D, passing from the rear to the front of the chair, and then drawing the chair from the former on its backward motion, the said discharger being arranged and operated substantially as described.

Eighth, As a new product, I claim a swaged rail-chair, such as represented in fig. 8, the fibers of said chair being transverse to the length of the rail, which is to be supported by it, substantially as described and for the purpose set forth.

58,156.—Machinery for Coiling Springs.—Richard Vose and Wm. Toshoch, New York City.

We claim the inclined edged stationary guide plate, S, or its equivalent, in combination with the cylindrical mandrel, D', and one or more swaging and forming wheels and rollers, revolving in unison, all substantially in the manner and for the purpose herein set forth.

58,157.—Oil Can and Oiler.—James E. Weaver, Temperanceville, Pa.

I claim the arrangement of the division, d, and tube, c, when used in connection with the body, a, and conductor, b b', as herein described and set forth.

58,158.—Hay Rack.—D. N. Webster, Geneva, Ohio.

First, I claim the sliding bar, H, spring, P, cross sills, G G', the levers, f and i, in combination with the sections, F F', as arranged in the manner and for the purposes set forth.

Second, I claim the sides, A, as hinged and arranged in combination with the sections, F F', and ends, D, for the purpose and in the manner herein described.

Third, I claim the ends of the rack, D D, the catch, b, spring, e, and the loops, a, as arranged and in combination with the sides, A, and sections, F F', in the manner and for the purpose as substantially set forth.

58,159.—Ventilating Pipe for Stoves and Heaters.—A. A. Wilder, Detroit, Mich.

I claim the arrangement of the supplementary pipe, B, with its portion, a a, as described, with the elbow joint of a stovepipe, combined and operating in the manner and for the purpose specified.

58,160.—Toys.—Job T. Williams, Philadelphia, Pa.

I claim constructing rocking toys out of single pieces of tin or other metallic plates, substantially in the manner above described.

58,161.—Gate.—James F. Winchell, Springfield, Ohio.

First, I claim the combination with the pivoted bars, a, the slotted brace, C, secured by the bolt, n, and nuts, l, when arranged to operate as and for the purpose set forth.

Second, I claim the rubber washer, i, when used in combination with the brace, C, and gate, as and for the purpose set forth.

58,162.—Improved Machine for Wiring Sheet-metal Pans.—F. M. Woods, York, Ill.—Antedated Sept. 2, 1866.

I claim the sliding section, C, in combination with the adjustable grooved wheel, D, arranged in a suitable framing, to operate in the manner substantially as and for the purpose herein set forth.

58,163.—Disinfectant.—Lucy Broad (assignor to Charles A. Broad), St. Louis, Mo.

I claim the combination of the materials herein described in the proportions specified, or their chemical equivalent, for the purpose of producing a fumigating disinfectant.

58,164.—Steam Generator.—E. P. Chase (assignor to himself and John Eaton), Rockland, Maine.

First, I claim the arrangement of an annular steam generator, C, substantially as and for the purpose set forth.

Second, The combination of the annular generator, C, with the heater, B, substantially as and for the purpose described.

Third, The superheating pipe or pipes, P, in combination with the annular generator, C, and situated in the flue formed by the inner shell of said generator, substantially as and for the purpose set forth.

Fourth, The cap, g, weighted lever, F, and diaphragm, l, in combination with the generator, C, and pump, E, constructed and operating substantially as and for the purpose described.

Fifth, The slide, M, channels, t, chamber, u, and additional smoke pipe, L', in combination with the grate, D, and generator, C, constructed and operating substantially as and for the purpose set forth.

58,165.—Egg Beater.—Charles McDrennan, Boston, Mass., assignor to Wm. P. and Isaac Gannett, Roxbury, Mass.

I claim the gauze diaphram, c, when supported and inserted by the wires, d d, attached to the cover, as and for the purpose specified.

58,166.—Combined Corn Planter and Broadcast Seeder.—Andrew J. Edgett (assignor to himself, John W. Ferry and A. Graves), Hornellsville, N. Y.

First, I claim the construction and combination of a corn planter with a broadcast seed sower, so that either machine can be used, substantially as described.

Second, I also claim the distributing wires, I, in combination and arrangement with the grain box and slide of a broadcast seed sower, for the purpose and substantially as set forth.

58,167.—Clamp for Planking Floors.—H. B. Gregg (assignor to himself and James Gable), Camden, Ohio.

I claim the clamp, A, the bar, B, the guide, h, the press block, c, the lever, M, the bar, N, the pawl, f, and the plate, P, the whole constructed, arranged, and operating as and for the purpose herein described.

58,168.—Necktie.—Ira W. Hamlet (assignor to himself and Henry J. Chapman), Nashua, N. H.

I claim the new manufacture or necktie as made with hooks, B B, applied to and arranged with the part or cravat, A, substantially as set forth.

I also claim the combination of the hook, B, the cravat, A, and the stiffener or plate, C.

I also claim the combination of the cravat hook and stiffener, the same being for the purpose set forth.

58,169.—Composition Roofing.—James G. Holliday (assignor to himself, Wm. Hastings, J. Harlan and R. A. McCabe), Wheeling, West Virginia.

I claim an improved composition roofing, formed by combining coal tar, acid tar, still bottom of petroleum, finely ground brick clay and refuse lime from gas house, in the proportions and in the manner substantially as herein described and for the purposes set forth.

58,170.—Attachment for Pumps.—Thomas J. Jones, Summit, N. J., assignor to Charles J. Eames and Wesley Welty, New York City.

I claim a suction attachment by which a pump may be constantly supplied with water, and the introduction of solid substances to choke its action may be prevented, all substantially in the manner above described.

58,171.—Covering for Floors.—Clement Keen (assignor to Keen & Co.), Philadelphia, Pa.—Ante-dated Sept. 2, 1866.

I claim a floor covering consisting of burlap or other equivalent textile fabric and paper or paper pulp combined, substantially as set forth.

58,172.—Weight.—Daniel B. Lacy, Mott Haven, N. Y., assignor to himself, Isaac A. and Thomas T. Lacy, Jersey City, N. J.

The construction of weights with an outer case of sheet metal and a filling of "slag," and a malleable or wrought metal ring or shank, around which the slag is cast, all substantially as herein set forth, for the purpose specified.

58,173.—Molder's Flask.—E. C. Little (assignor to Eveline Little), St. Louis, Mo.

The combination of the hinges, B B, and the pins, C C, with the protecting frames, D D, when cast together in one piece, and so arranged and applied in connection with the cope and drage of molder's flasks as to permit a match plate pattern, a, to be placed between them without derangement by side movement, substantially as herein described.

58,174.—Bottle Stopper.—John Mulchahey (assignor to himself and Charles Mulchahey), Springfield, Mass.

First, The arrangement of a safety valve in the stopper of a bottle, substantially in the manner and for the purpose set forth.

Second, The use of a rubber or similarly elastic stopper, when the same is fitted in a case, A, which is hinged at one side, and fastened by a catch or latch at the other, substantially as set forth.

Third, I claim holding the latch or catch, b, by means of the pivoted bar, H, which is also held in place by means of the spring, K, or other suitable means, substantially as described.

58,175.—Drilling Machine.—Robert Nutty (assignor to himself and John Scott), New York City.

First, I claim the piston cylinder of a steam, atmospheric, or other suitable engine, with the piston of which a drill rod is suitably connected, so hung that it can be adjusted to enable the drill to be brought to bear against the surface of the rock or other surface to be drilled, in any desired situation, whether in a vertical or horizontal plane or in any intermediate plane, substantially as described.

Second, A piston cylinder through which a drill rod is operated, hung upon the boom or supporting beam therefor, in such a manner that it can be moved thereon and set at any desired position according to the point of the rock or other surface against which the drill is to act, substantially as and for the purpose described.

Third, The tongued lever, I5, hung to the outer end of the drill boom, and having an extension arm, P5, swiveled or pivoted to it, substantially as described and for the purpose specified.

Fourth, The piston cylinder hung by trunnion pins, to and in a frame, W, that by trunnion pins is suspended in the eyes of screw rods, S, having screw nuts, T2, said screw rods passing loosely through the boom, K, or its equivalent, substantially as and for the purposes set forth.

Fifth, The extension frame, C2, secured to the bottom of the piston cylinder, in which frame slides a cross head, E2, carrying the drill rod, N, and connected with the piston head of the cylinder, in connection with which it moves, substantially as and for the purpose described.

Sixth, The arrangement of the bevel pinion, H2, on the drill rod ratchet pinion, I2, hung in stationary bearings of the frame, C2, and spring pawl, L2, secured to sliding cross head, E2, when arranged and connected together so as to operate upon the drill rod as the cross head moves forward and backward, substantially as described and for the purpose specified.

Seventh, The tappet wheel, G4, walking beam, J4, having drill rod, B4, suspended in its outer end, connecting link or piece, M, double crank shaft, O4, rod, Q4, connected with crank arm, S4, carrying a pawl which engages with the ratchet wheel, V4, of the said drill rod, B4, when the several parts are combined and arranged together so as to operate upon the drill rod, substantially in the manner and for the purpose described.

Eighth, The arrangement and construction of the framework of the machine, the same consisting of the parallel horizontal slotted platforms, D and H, connected to a common center post, G, and supported at suitable points by uprights, J, for holding the drill booms, the whole being supported upon suitable wheels or friction rollers, and arranged and connected together, substantially in the manner described and for the purpose specified.

58,176.—Piston Packing.—William A. and Thomas F. Powers (assignors to William A. Powers), Brooklyn, N. Y.

First, We claim the packing rings, e g, constructed with annular grooves or rebates, c, in their outer sides, and combined with the bull ring, A, and perforated flanges, B, substantially as herein set forth for the purpose specified.

Second, The annular groove, c', formed at the innermost edge of the rebate, c, and arranged in combination with the rebated packing ring, e g, and the perforated flange, B, substantially as herein set forth, and for the purpose specified.

Third, The packing pieces, m, constructed as described in combination with the tongues, t, on the rings, e, substantially as and for the purpose herein specified.

58,177.—Plow.—John A. Quick (assignor to himself and Charles R. Holliday), South Danville, N. Y.

I claim the combination with the plow having mold board and land side, of the conical rotating point, H, shaft, F, gearing, I, M, and supporting wheel, J, operating substantially as described.

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58,178. — Shoe Shanking. — Timothy K. Reed, East Bridgewater, assignor to Samuel J. Shaw, and Thomas Corey, Marlboro, Mass.

I claim so combining and arranging a knife or knives and bed and guide pieces that in scarfing one edge of each piece of the shanking, the opposite scarf of the next piece is formed thereby, substantially as described.

Also, combining with a bed which holds the stock in position to be cut square or at one angle to its supported edge, a bed which supports the stock in position to be cut at an angle to the opposite side, substantially as described.

Also, conjointly and specifically the provision for cutting stock of various thicknesses and into various widths for scarfing the material to a greater or less degree, and for inclining one of the scarfed edges more or less, all substantially as specified.

58,179.—Low-water Detector for Steam Generators.—Thomas Savill (assignor to C. Jones and Cadbury), Philadelphia, Pa.

I claim the hollow spindle, C, with its valves and openings in combination with the valve chest, A, its valve seats and openings, b, the whole being constructed and operating substantially as and for the purpose specified.

58,180.—Burning Fluid.—John B. Scott, Hyattsville, Md., assignor to himself, Geo. Hall, Prince George Co. and S. Mop, Baltimore, Md.

I claim the use of the above described ingredients, composed as and for the purpose herein specified.

58,181.—Sewing Machine. — Sidney M. Tyler, Brooklyn, N. Y., assignor to The Empire Sewing Machine Company, New York City.

I claim the rocking shaft, g, crank, k, link, l, and shuttle driver, m, arranged and acting on the shuttle in the manner specified, in combination with the needle bar, m, and cam, q, for giving the specified motions to the needle, as and for the purposes set forth.

58,182.—Sewing-machine Shuttle.—Sidney M. Tyler, Brooklyn, N. Y., assignor to The Empire Sewing Machine Company, New York City.

I claim the tapering rearward projecting point, 3, of the shuttle, in combination with the spring thread detainer, c, extending to the rear of the heel of the shuttle, as and for the purposes set forth.

58,183.—Machine for Cutting the Corners of Paper in the Manufacture of Boxes.—Daniel Whitlock (assignor to himself and J. M. Seymour), Newark, N. J.

First, I claim the providing of the knife or cutter, I, with pendent bars, g g, to serve as guides for the same, substantially in the manner as and for the purpose set forth.

Second, The adjustable bed piece, F, in combination with the knife or cutter, I, substantially as and for the purpose set forth.

Third, The graduating of the edges of the opening, d, in the bed piece, F, in combination with the adjustable gages, G G, substantially as and for the purpose set forth.

58,184.—Railway Chair.— Thomas Whittemore (assignor to Edmund G. Lucas), Cambridgeport, Mass.

I claim the combination and arrangement of the two wedged jaws, C C, and the wedge socketed base plate, F, constructed, arranged and applied together, substantially as and so as to operate as specified.

58,185.—Fruit Jar.—J. F. Winchell (assignor to himself and Joseph Leffler), Springfied, Ohio.

First, I claim the circular bead, b, on the under side of the cap, B, for the purpose herein described.

Second, The pressure lever, D, having projections, c, cam-lever, E, in combination with the bridge, C, and cap, B, when arranged to operate substantially as described.

58,186.—Instrument for Cutting Teeth.—Eugene Bourguard (assignor to himself and Pierre Boisset), Paris, France.

I claim a perforated tube in connection with a handle or any other contrivance for closing the open end of the tube, together with a sponge or other porous substance to be used as above described. The sponge may be dispensed with and the perforated tube filled with sugar or any other sweet substance of such consistency as will not require a sponge to hold it.

58,187.—Cotton Gin.—Frederick T. Ackland and Henry G. Mitchell and Mustapha Mustapha, Zagazig, Egypt.

We claim the application and use to and in the Macarthy cotton gin, or other cotton gins of a like character, of a feeding bar or surface having a rectilinear reciprocating motion along the grid or grating, for the purpose of pushing the cotton up to the gumming roller and "doctor," substantially as hereinbefore described and illustrated by the annexed sheet of drawings.

58,188.—Cultivator.—Alexander Anderson, London, C. W.

First, I claim the mode of suspending the cultivator frame beneath the axle by means of the chains, G G, rods, R R, and levers, J K K, so arranged, as described, to give it the necessary lateral and vertical play.

Second, The slotted extension axles, F' F', counterpart central portion, F, and bolts, S S, constructed and operating as described and represented.

58,189.—Apparatus for Indicating the Speed of Vessels.—Thomas Walker, Birmingham, Eng.

I claim the adaptation or combination of means forming apparatus for indicating the speed of vessels whereby the wheelwork and index are placed in front of the vanes of the rotator and they are definitely acted upon to have motion given to them in the rotation of such vanes and in which the rotating vanes and the chamber containing the wheelwork are immediately connected, substantially as explained.

58,190.—Machine for Slicing and Drying Peat—A. H. Emery, New York City.

First, I claim the combination for cutting peat to facilitate its drying of a knife or slicer attached to or carried by a wheeled vehicle and breaker, set in motion by the draught, for operation together, substantially as specified.

Second, The combination with the knife or slicer, 9, and its pronged stock or cover, of a revolving toothed breaker, arranged and operating together essentially as and for the purpose or purposes herein set forth.

Third, Connecting the knife stock with the frame of the vehicle by means of slotted side uprights made capable of vertical adjustment through the frame, as specified.

Fourth, The combination with the sliding uprights of the knife stock, of the levers, 2 2, screw nut or box, 2 8, and its adjusting screw, for action together, as shown and described.

Fifth, In combination with a revolving toothed breaker, the hangers, 5, supported by or on the axle of the running wheels also carrying the revolving shaft of the breaker with its gear and made adjustable relatively to the frame of the machine, substantially as specified.

58,191.—Rotating Harrow.—Silas Grenell, Mokena, Ill.

I claim a revolving harrow, when constructed with a frame, A, and circular plate or ring, C, upon which the draught is applied by the wheel, I, attached to the tongue, the harrow turning upon a wrist pin, E, and having an arm, G, carrying a weight box, K, resting upon the track, B, on the friction wheel, K, said several parts being respectively constructed and arranged for use, substantially as set forth.

58,192.—Churn.—John R. Mickey, Chicago, Ill.

I claim the combination of the cog dashers, B and B', when constructed substantially as and for the purpose set forth.

58,193.—Fence.—Benning Rowell, Elmira, N. Y.

I claim a portable fence so constructed that the boards or rails, A1 and A2, supporting the panels shall be interlocked and sustained upon posts, B, and be held in place by intermediately placed hooks, C, fastened to short posts, D, and arranged to operate substantially as set forth.

REISSUES.

2,357.—Process and Apparatus for Carbureting Gases for Illumination.—John A. Bassett, Salem, Mass, assignor to Thomas D. Worrall, New York City. Patented March 4, 1862.

First, I claim the combination, substantially as herein described, of the vessel, A, in which the gas passes circuitously over the surface of the hydro-carbon liquids to be partly carbureted and cooled by the evaporation of the liquids, and the vessel, B, containing a porous substance, and saturated with such liquid, through which the gas subsequently passes, as herein set forth and described.

Second, The gas regulating valve, j, and float, k, combined with a gas naphthalizing or carbureting apparatus, substantially as herein specified, that is to say, with the float floating in the naphtha or other hydro-carbon liquid used for the carbureting processes.

Third, I claim, in combination with a carbureting apparatus, a regulator to govern the flow of gas to the burner, substantially as described.

Fourth, The use of carbon-spirit or light products of petroleum for the purpose of carbureting air or of enriching and carbonizing any kind of gas.

2,358—Preventing Rattling in a Carriage.—William S. Chapman, Baltimore, Md. Patented Aug. 8, 1854.

First, I claim the employment of blocks of india-rubber, or other equivalent elastic material, so shaped as to be self-sustaining in position when interposed between the ends of the carriage shafts or poles and the "clip" to prevent rattling, substantially as above described.

Second, I also claim the use of india-rubber blocks, or other equivalent elastic material, interposed between the ends of carriage shafts and the "clips," in such a way and under such strong compression as to hold the bolts in place independently of the nuts, and also to prevent the rattling of the parts, substantially as above described.

Third, Finally, I claim as a new manufacture a block of india-rubber, or other equivalent elastic material, intended to be used as herein contemplated, when made substantially in the form described, that is to say, when so shaped that it will remain permanently in place, and perform its functions without the aid of any other special contrivance for that purpose, in the manner above set forth.

2,359.—Operating Slide Valves in Direct-action Engines.—G. W. Hubbard, Brooklyn, N. Y., and William E. Conant, Little Falls, N. J. Patented Jan. 9, 1855.

We claim, First, So combining a main engine or motor, a supplementary valve-working engine and their induction and eduction valve or valves, that the movement of the valve or valves of the main engine or motor is commenced and partly effected by the piston of said engine, and completed by the piston of the supplementary or valve-working engine, substantially as herein described.

Second, When two direct-action engines are so combined that the movement of the induction and eduction valve or valves of one is produced by the movement of the piston of the other, we claim the arrangement of the cylinder and piston of one engine within the valve chest of the other, substantially as herein described.

Third, In operating the slide valve in one direct-action engine by the piston of another, we claim so connecting the said slide valve with a tappet-rod operated by an arm on the piston-rod of its own engine, that the said rod and valve may have each a certain amount of motion independently of the other, substantially as and for the purpose herein specified.

Fourth, The arrangement of the valves, E and k, the tappet-rod, F, and its connections with the said valves, and the cut-off plate, j, and stops, l l, substantially as described for the purpose set forth.

2,360.—Hay-hoisting Machine.—John S. Lloyd, Salem, N. J. Patented April 24, 1860.

First, I claim an elevated way or railroad, A, in combination with a hoisting or horse hay fork, F, arranged to operate in the manner substantially as herein shown and described.

Second, The construction, combination, and arrangement of the fork, cords, levers, pulleys, springs, and railway, the arms, E E, to the block, D, and the mode of attaching and supporting the railway to the barn or frame, so as to allow the wheels, B B, with the attached blocks and fork, to pass freely along the length of the rail.

Third, The post, P, as constructed in combination with the pulley, lever, slide, spring, and cord.

2,361.—Knob Latch.—Wallace T. Munger and J. A. Leggat (assignees of Wallace T. Munger), Branford, Conn. Patented April 3, 1866.

First, I claim the follower, E, recessed in its rear side, in combination with the bar, a, of the yoke, H, attached to the latch bolt, substantially as and for the purpose specified.

Second, The horse shoe, F, link, I, and spring, M, in combination with the lock bolt, D, substantially as and for the purpose set forth.

2,362.—Wagon-shaft Shackle.—H. D. Smith, G. F. Smith, and Edward W. Twichell (assignees of James P. Thorp), Plantsville, Conn. Patented May 1, 1860.

We claim the improved manufacture of carriage-shaft shackle blank, constructed with the projections, d d, arranged at or about at the junctions of the arms and body of the blank, substantially as and for the purpose specified.

Also for making the said blank, the die as constructed with the projection forming recesses, arranged with respect to the portion for swaging the body and arms of the blank, substantially in manner as specified.

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Kensington, Philadelphia, Aug. 13, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—I will say in reply to yours of the 9th inst., that I have had one of your Boilers almost in constant use over one of my Puddling Furnaces for over eighteen months, and in all that time it required no repairs, with the exception of changing a few light bolts for heavier ones, and it is now running without any signs of leaking or want of repair, apparently as good as when first put up. I think I have just grounds, from the experience I have had, to recommend them as a good and safe boiler, and one that generates steam very fast. I feel confident that I get nearly double the quantity of steam from this boiler that I do from any other Puddling Furnace in my Mill that has two Cylinder Boilers over them. I believe the day is not far distant when they will be in general use in Iron Manufacturing establishments.

Yours respectfully,
STEPHEN ROBBINS.

Artisan Hall, 611 and 613 Sansom street, Philadelphia.

Mr. Joseph Harrison, Jr.:
Dear Sir:—We take great pleasure in testifying to the merits of your Boiler, as a generator of steam, the confidence we have in its safety, its economy of fuel, and also of space for its erection. It has now been in successful operation more than a year, without the necessity of any repairs, and our confidence increases with its use. We shall always consider it a privilege to exhibit and explain its merits to any who may wish to examine it.

Respectfully, etc.,
GEO. W. SIMONS, BRO. & CO.

Philadelphia, Aug. 9, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—In reply to your communication respecting our opinion of the "Harrison Boiler," we would state as follows: We have had one of your Boilers in constant use for twenty-two (22) months, during which time it has supplied steam to a 6-horse Engine, driving about seven lathes and several other power tools. It is perfectly tight and free from leakage; takes up less room than an ordinary Boiler; and as to its economy in fuel, you can best judge for yourself, from the following statement: During the past year it has burned from 50 to 60 tons Pea Coal, each week averaging 6½ to 7 days. We can truly recommend said Boiler, from our own experience, as safe, reliable, and economical.

Truly yours,
TAWS & HARTMAN, 1237 North Front street.

Office of the Salem Coal Company,
Philadelphia, August 16th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—After having your cast-iron Boiler in use at the Colliery of this Company for more than a year, it gives me pleasure to state that its operation has been very satisfactory. In the important point of economy of fuel it is reported to be superior to any other Boiler we have in use, and as regards its safety from destructive explosion, it certainly has no equal among all the various forms of boilers that have come under my notice.

Very truly,
JNO. C. CRESSON, Pres't.

Germantown, Aug. 16, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—About four months ago, we put in one of your "Harrison Boilers," and it gives us much pleasure to be able to state that, as a safe steam generator, in its general economy in fuel, time, etc., we consider it the best Boiler now in use. Our Boiler is 50 horse-power; our Engine has a 10-inch cylinder, with a 36-inch stroke: the cost of running this, and almost always at its utmost capacity, is about two dollars per day. In fact, we consider your Boiler so excellent in its services, aside from its safeness from explosion and its real economy, that we could not and would not do without it. It will afford us much pleasure to show the "Harrison Boiler" to any one who may call at our Works, where they can daily see it in practical operation.

Very truly yours, etc.,
SELSOR, CROOK & CO.,
Manufacturer of Edge Tools, Hammers, etc., Armat-st.,
Germantown, Philadelphia.

New York, August 15th, 1866.

Mr. Joseph Harrison, Jr., Philadelphia, Pa.:
Dear Sir:—We take pleasure in informing you that the Boiler purchased from you, which we have had in use about five months, has given the best satisfaction, and has borne out everything you claimed for it. As a steam generator we have never seen anything equal to it. We consider the saving of fuel as being very great compared to ordinary boilers. If we had need of more steam capacity, we should most certainly use your Boiler in preference to any other. You are at liberty to use this, if it will be of any service to you. Yours truly,
UNITED STATES WATCH CO., F. A. GILES, Pres't.

Pennsylvania Hospital for the Insane,
Philadelphia, August 11, 1866.

My Dear Si :—In my annual Report of this Institution, for 1865, I stated my high estimate of your Boiler, for safety, economy, and general efficiency. Additional experience has tended to confirm all that I then said, and if we required additional Boilers, for any purpose, I should certainly recommend yours.

Very truly yours,
THOMAS S. KIRKBRIDE.

Jos. Harrison, Jr., Esq., Philadelphia.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—The "Harrison Boiler" we bought of you, some four months ago, has given us perfect satisfaction. The Boiler is placed over one of our heating furnaces, and, in consequence of the steam-pipe connections with our main steam pipe, we have no means of testing its economy in fuel. We believe it to be safer and more economical than the Cylinder Boiler, and have no hesitation in recommending it as admirably adapted for Rolling Mills. Its length, the same as the length of a heating furnace, enabled us to place it immediately over the furnace, requiring no additional space, thus avoiding the necessity of locating the furnaces at an inconvenient distance from the machinery, which the ordinary Cylinder Boiler requires.

Very truly yours,
VERRAE & MITCHELL.

Philadelphia, Aug. 15th, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Before ordering one of your Boilers, we sought information respecting them from several of our friends who were using them. Their testimony was of such a character that we felt no hesitation in adopting it, and it has more than answered our expectations. We recommend them as safe, very economical, and easily managed; they possess fully all the advantages you claim for them.

Very respectfully yours,
L. MARTIN & CO.,
Manufacturing Chemists, City Office 140 South Wharves.

Atlantic Mills, Ellwood, Atlantic county, N. J.,
August 13th, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—We have had one of your Six-slab Boilers in use in our Paper Mill for five months. We consider it unequaled by any other make of boiler now in use. With less than one-half the fuel it produces more and drier steam than any boiler we ever used. It is simple, easily managed, and perfectly safe. Our Boiler bleaches the stock for, and dries one tun of paper daily, with one cord of pine wood per day.

Very truly,
McNEIL, IRVING & RICH.

Mercantile Printing Rooms, Franklin Building,
Philadelphia, 16th Aug., 1866.

Joseph Harrison. Jr., Esq.:
Dear Sir:—I am very much pleased with the Boiler you put in for me some nine or ten months ago. It has been in constant use—no trouble—no repairs—no stopping to clean out, and steam can be "got up" in about twenty minutes. It requires less coal than the Cylinder Boiler formerly used here, although it is doing a great deal more work. I cheerfully recommend it as being and doing all that you claim for it.

Yours very respectfully,
JAMES B. RODGERS.

Daily Evening Bulletin,
Philadelphia, Sept. 1, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—We have one of your 31 Horse-power Globular, Five-Slabbed Boilers, known as the "Harrison Boiler," in use now nearly five months, and as a safe, reliable steam boiler, and for economy of fuel, we think it cannot be equaled.

We have a ten horse-power engine, running eight hours per day, with an average saving of 50 per cent in the use of fuel over the old-style boiler. Our Engineer, Mr. George Lodge, has had over thirty years' experience in the management of boilers, and he has no hesitation in pronouncing the Harrison Boiler the "Best" he ever worked.

Very respectfully yours,
EVENING BULLETIN ASSOCIATION, 607 Chestnut-st.

Earle Stove Company,
Worcester, Mass., Sept. 3, 1866.

Joseph Harrison, Jr.:
Dear Sir:—Before purchasing your boiler, we examined with much care the various kinds now in use, determined to get "The Best." After eight months' trial, our experience conclusively confirms the correctness of our judgment in making choice of yours. Our President (T. K. Earle), and Treasurer (Edward Earle), who have in their Card Factory, one of the best of tubular boilers, are now putting in one of yours. We refer you to our Engineer, Mr. Frederick Edwards.

Truly yours,
EARLE STOVE CO., SIDNEY SMITH, Supt.

Worcester, Mass., Sept. 3d, 1866.

After an experience of twenty years in running the most approved boilers and engines in use, I regard the Harrison Boiler, made by Joseph Harrison, Jr., of Philadelphia, the most economical for fuel, safest, quickest working, and one that will give the steadiest motion to the engine with the least attention.

FREDERICK EDWARDS, Engineer,
Earle Stove Co., Worcester, Mass.

Worcester, Mass., 9th mo., 6th, 1866.

Joseph Harrison:
Dear Sir:—We received your letter, and in answer will say, we are highly gratified with Boilers. The one we are using at the Earle Stove Co. has been in operation, since the first of the year, in perfect order. We have just got in operation the last sent, at our Card Factory, and are running it beside a Tubular of about the same capacity: so far we find a saving of about one-half by actual measurement.

Truly yours,
T. K. EARLE & CO.

Alpine Mills, Howards, Center county, Pa.,
September 8, 1866

Joseph Harrison, Jr., Esq.:
Dear Sir:—It gives me great pleasure to be able to inform you that your Boiler comes up to the most sanguine expectations; in fact, all that you can possibly claim for it: being economical, safe, and a speedy generator of steam. Since they were first put up in the spring (which, by the way, was done without having a mechanic on the ground, except the mason), according to your plans, sent gratis, the first leak, trouble, or delay has yet to make its appearance. Steam is kept up from 75 to 90 lbs. for Wm. H. King's (1015 Sansom street), 25 horse-power Oscillating Engine, with saw dust, there being but a 25-feet iron stack of 2 feet diameter. . . .

I am, dear Sir, yours very respectfully,
PERCY H. WHITE, Agent.

Lincoln Mills,
S. W. cor. 25th and Spruce streets, Philadelphia, Sept. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—In reply to your letter of the 9th ult., I would say that I have been using the "Harrison Boiler" for more than two years, and it gives me great pleasure to state that I find it entirely satisfactory. I have had both Cylinder and Tubular Boilers in use, and have consequently been able to compare each of them with yours. I have two of your boilers of 75 horse-power each in use, and my engine is 70 horse-power. I do not require more than 50 lbs. of steam, but would not hesitate to run up to 250 lbs., if necessity required me to do so. I had each of the slabs tested in my presence to 600 lbs. to the square inch. I know that it requires less fuel than the best of either the Cylinder or Tubular Boilers. My neighbor, with about the same machinery, using the steam for power generally, and heating his Mill with exhaust steam, informs me that he burns four tuns of coal per day under his Cylinder Boiler, while I used less than two tons per day, during the coldest days of last winter, and heated my Mill with live steam, in addition to the amount required for power. The question of durability is one of time. I think that in consequence of the ease with which it can be cleaned or repaired, that it will last far longer than any other kind now in use. It is perfectly safe. There is no danger whatever of explosion. I do not hesitate to recommend it. If I ever need another boiler, I will get one of yours in preference to any other that I now have any knowledge of.

Yours truly,
SAMUEL W. CATTELL.

Superintendent's Office, Camden and Atlantic Railroad,
Camden, N. J., Aug. 21, 1866.

Joseph Harrison, Jr.:
Dear Sir:—You ask our opinion of the safety, economy in fuel, and general merit of the Harrison Boiler we have in use. I deem it a safe Boiler; from its construction I do not think it possible that a disastrous explosion can occur. It is a rapid generator of steam, and requires less fuel than any boiler that has come under my notice. . . . . .

Very respectfully yours,
G. W. N. CUSTIS, Supt.

Philadelphia, Aug. 10, 1866.

Joseph Harrison, Jr., Esq.:
Dear Sir:—Having charge (as administrators) of the Worsted Mills of the late Mr. Samuel Yewdall, at which the recent terrible explosion of a wrought-iron boiler occurred, we have decided to avoid a recurrence of such a calamity in the future, and, believing your Boiler to be the only one absolutely free from danger from explosion, and at the same time equal, if not superior, as a generator of steam, and in economy of fuel, to any boiler now in use. You will please accept our order, to furnish us for said Mills, two fifty horse-power Boilers, to be used separately or in conjunction. By complying quickly with the above order, you will very much oblige,

Yours truly,
JAMES HUNTER, }
N. R. SUPLEE, } Administrators.

Rock Island Manufacturing Company,
Charlotte, N. C., August 23, 1866.

Mr. Joseph Harrison, Jr.:
Dear Sir:—Our experience with your Boiler warrants us in bearing testimony to its superiority over any other with which we are acquainted. Ours is a 100 horse-power boiler, and drives six sets of woolen machinery, and furnishes steam for our dyeing operations, and for heating the mill. Our fuel is wood, and we use three cords per day to do all our work, whereas, we formerly used that quantity under Cylinder Boilers, merely to furnish steam for our dye house, and heating the mill. Our experience is, that in fifteen minutes after applying the fire in the morning, we have on a full head of steam, and our machinery at work. We have had it in use only a few months, it is true, but we presume long enough to test its adaptation to our fuel and our work, and have found it in every respect to come up to your representations. Our Boiler was set up and put to work by a man who never had seen it done, without the the slightest difficulty. Your Boiler commends itself for economy in fuel, and its merits need only to be known to render it universally popular.

Very respectfully yours,
14 4] JOHN A. YOUNG, President.

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We can furnish from our Stock nearly all Sizes of Square, Flat, Octagon, or Round Tool Steel, from ⅛ to 4 inches, of Superior Quality. Warranted equal to any imported or produced in this country. SWEET, BARNES & CO.,
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P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or selling these instruments without authority from me will be dealt with according to law. [11 tf

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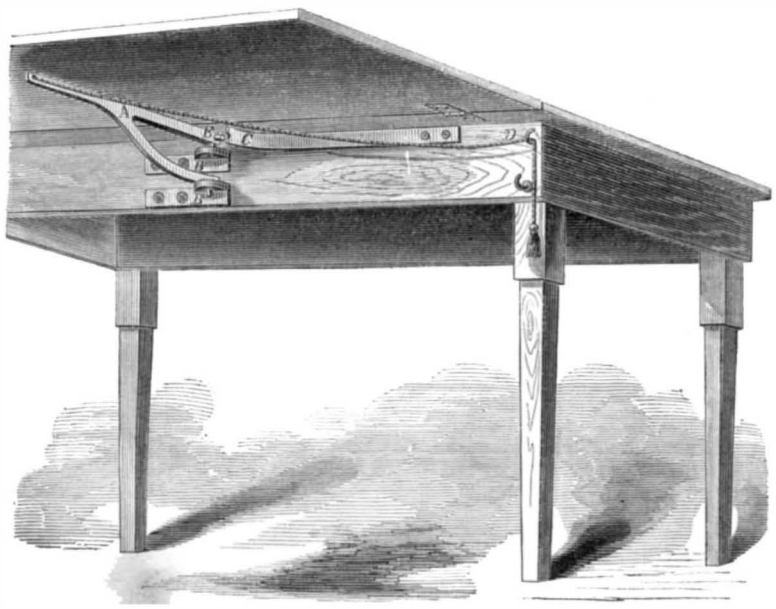
Improved Table-leaf Supporter.

The engraving of this improved table-leaf supporter represents the device so plainly that but little explanation is necessary. It is designed to obviate the necessity for the stooping and lifting required in spreading heavy table leaves. The support, A, is of metal, swiveled to the table by the pivot pieces, B, and held in position by the spring, C. When the leaf is to be lowered, the cord, D, is pulled, and the spring is depressed by the lug, E, allowing the support to shut against the table frame. The simple raising of the leaf to a horizontal position allows the support to spring out without the intervention of the hand.

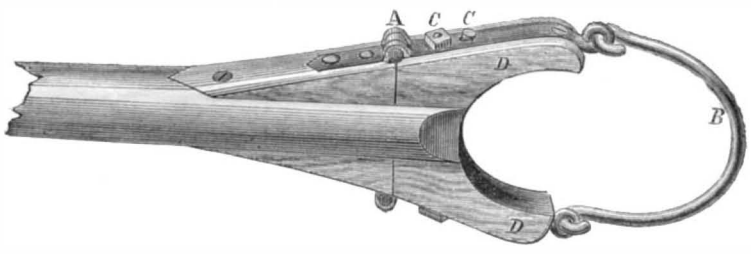


CAVENDER'S TABLE-LEAF SUPPORTER.

Patented through the Scientific American Patent Agency July 3, 1866, by L. R. Cavender, Eureka, Woodford county, Ill., to whom apply for rights to vend and manufacture.

Improved Boom and Gaff.

The object of the improvement here illustrated is to allow a worn jaw of a boom or gaff, to be conveniently removed and replaced by another, without injuring or removing any other portion. The jaws are bolted to the boom in the usual way, but at A, the straps terminate in hinges to allow of the removal of either jaw. The hoop, B, hooks into eyes at the ends of the straps. By driving out the bolts, C, the jaws, D, may be taken off and new pieces fitted. The advantages of this device will be seen by practical navigators and seamen.



MANNING'S BOOM AND GAFF.

It was patented May 1, 1866, by Alfred Manning, Fair Haven, Conn., to whom all letters on the subject should be addressed.

Gas Odors.

A director of a gas company recently wrote to the London *Times* that the excessive impurity of London gas has a beneficial effect in keeping away the cholera, and that none of the workmen in the metropolitan gas works have ever died of that disease, although their duties expose them to great alternations of heat and cold, and they are notably intemperate. The director, however, is directly contradicted by two different writers. Mr. Simcox Lea, incumbent of one of the churches at Bow, declares that no class of men in his neighborhood have suffered so heavily from the cholera as the class employed in the gas works, and the engineer of the Commercial Gas Company says that his company lost five workmen in the first seven days of the present attack.

If the director of the gas company is correct, it might be said "that the remedy is worse than the disease." It may be, however, that the gases which the workmen at a gas-making establishment are compelled to inhale will have some effect in keeping away the causes of cholera; but it is a statement that requires corroboration. As yet there have been no circumstances of position or employment that have proved specifics against the cholera.

Pressed and Cast Bullets.

Machines have been made, and, we believe, are still in use, to press leaden bullets; but we have been told by those who have had much experience with fire-arms that the pressed balls are unreliable. The complaint is that the lead being closely compressed is heavier than a bullet which is run in a mold, and also that in time the pressed bullet expands until the metal regains its natural porosity, and thus becomes too large for the bore of the rifle. Whether these objections have any better foundation than whim or prejudice, or not, it is certain that some large establishments make only cast bullets. This is the case at Colt's pistol factory and Sharps's rifle works. The bullets are cast in metallic molds with lead at a high heat. Each bullet, when cold, is tested by an expert and all the light ones rejected. This is not determined by weighing, but simply by handling the balls, long experience enabling the workman to detect at once those which contain blow holes.

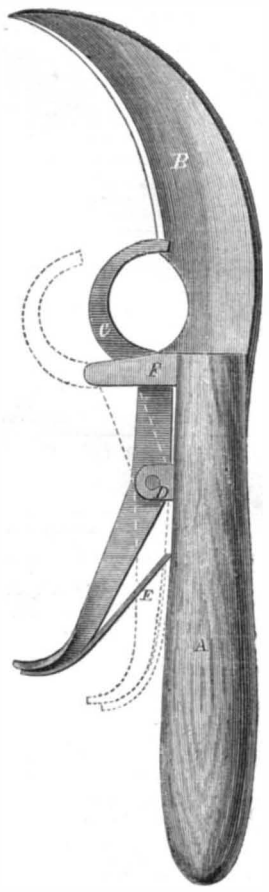
Test for Acids.

AN exceedingly sensitive test for ascertaining the presence of acids has been suggested by Schönbein; this is simple cyanine blue, easily produced by the action of iodide of amyl on lepidine subsequently treated with soda. One part of the cyanine dissolved in one hundred parts of alcohol is further diluted with twice its volume of water. The merest trace of an acid is promptly shown. Distilled water simply blown upon shows by this test the presence of carbonic acid from the lungs. The solubility of oxide of lead, which is so slight as to be unrecognized by sulphureted hydrogen, is clearly discovered by this test. By carefully adding acid to the solution till the blue color is destroyed, a very delicate test for the presence of bases may be procured.

CONARROE'S CANE KNIFE AND STRIPPER.

In crushing sorghum and other canes for the extraction of the saccharine matter, if the cane is not properly stripped, the leaves absorb the juices, and thus a portion of them is wasted. The improvement illustrated in this engraving is a device for combining a cutter and stripper for the cane.

A, is the handle and B the blade of the knife, which latter is hollowed, so that in connection with the jaw, C, the cane can be closely grasped. This jaw is pivoted at D, and held in place by the spring, E, the end of the jaw being notched to receive the edge of the blade, B. Two guides, F, assist to retain the jaw in position.



The operation, after topping the cane, is to open the jaw by the thumb, then, as the thumb is removed, the jaw and blade grasp the cane and a downward motion of the hand strips it of its leaves, and the stalk is cut by drawing the knife toward the operator. The value of the device is seen at a glance.

Patented through the Scientific American Patent Agency July 3, 1866, by Robert Conarroe. For State and county rights address R. Conarroe & Co., Camden, Preble county, Ohio.

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